Behavior of the Preschool Child

Lois M. Jack
Elizabeth Moore Manwell
Ida Gaarder Mengert
Esther Van Cleave Berne
Helen Garside Kelly
LaVerta J. Weiss
Agnes Fairlie Ricketts

NEW BOOK CO.
HAUZ KAZI, DELHI-6

BEHAVIOR OF THE PRESCHOOL CHILD

by

Lois M. Jack, Ph.D.
Elizabeth Moore Manwell, Ph.D.
Ida Gaarder Mengert, M.A.
Esther Van Cleave Berne, Ph.D.
Helen Garside Kelly, M.S.
LaBerta A. Weiss, Ph.D.
Agnes Fairlie Ricketts, M.A.

George D. Stoddard, Ph.D., Editor

University of Iowa Studies
Studies in Child Welfare

Vol. IX, No. 3

Published by the University
Iowa City, Iowa
1934

FOREWORD

Researches in child behavior, especially at the preschool age level, have been emphasized in the Station's program for many years. The present group of studies, while carried on with some independence by the various authors, illustrates an essential unity of approach. An understanding of the "whole child" is not so much a conscious aim of each investigator as an emergent from federated enterprises.

These researches add to our knowledge of the social patterns related to play, anger, and compliance, and they contribute useful validations of methods of observation and analysis. In addition, Miss Jack's success in changing the absolute and relative standing of children in ascendant activities constitutes a most fruitful lead for further study.

GEORGE D. STODDARD

Office of the Director
Iowa Child Welfare Research Station
University of Iowa
January 6, 1934

CONTENTS

PART ONE. AN EXPERIMENTAL STUDY OF ASCENDANT BEHAVIOR IN PRESCHOOL CHILDREN

LOIS M. JACK

PART ONE

AN EXPERIMENTAL STUDY OF ASCENDANT BEHAVIOR IN PRESCHOOL CHILDREN*

by

Lois M. Jack

* This study was directed by Dr. Ralph H. Ojemann.

CHAPTER I

INTRODUCTION

CONCEPT OF PERSONALITY TRAITS

Until seventeen or eighteen years ago writers assumed the existence of a number of hereditary behavior patterns and referred uncritically to instincts of self-assertion or domination. When the accuracy of these concepts was questioned, students of the subject began thinking of many of the so-called instinctive characteristics as perhaps arising from inherent tendencies, but taking a form determined by the experience of the individual. Even at this stage, however, the behavior patterns were considered as definite, generalized traits and as components of personality.

Assertiveness, aggressiveness, and similar traits can no longer be spoken of as definite traits characterizing an individual and being generally operative throughout his behavior. There are, of course, some few traits or specific patterns of activity characteristic of behavior which some investigators have found to be fairly constant in individuals. Cushing's (10) experiments on seventy children between the ages of two and five seem to indicate the presence of a common factor of "perseverative tendencies" running through the tasks in the six experimental situations she uses. In general, however, studies have failed to give evidence of the presence of such generalized traits.

Some relatively permanent characteristics which seem to underlie the behavior of an individual act as limiting or modifying factors in the determination of what we usually think of as actual traits. Dashiell (11), following Allport (2) in the main, mentions six very general characteristics of this basic type, including physique, intelligence, motility, temperament, motivation, and sociality. Park and Burgess (22) list characteristics which they label traits determining personality and not directly personality traits. These include not only basic factors such as intelligence and temperament, but the socially determined factor of one's conception of his rôle in the group. Krueger and Reckless (16) include among traits determining personality all of an individual's attitudes and the

organization of his values in terms of those held by the society in which he lives, a part of what Thomas and Znaniecki (28) have called the "life organization."

Young (34) probably has the most acceptable and complete conception of the term person or individual with personality. He uses the term to mean the "various social rôles which the individual is called upon to play," and as "the attitudes, ideas and habits directed in reference to the social environment; that is to other persons and the cultural patterns."

The conception of generalized personality traits is misleading. The most cursory observation, however, reveals the presence of certain individuals in every group who show ascendant behavior more frequently than others. They pursue their own activities against opposition, control the behavior of their fellows, and determine the activities in which others engage much oftener than do their companions. It is with behavior of this type that this study is concerned.

The attitude is here maintained that the various tendencies in social behavior, among them the tendency to direct the activities of others, are in part a function of the immediate situation. Among the other factors assumed to be in operation are the individual's status in his group as expressed in other's attitudes toward him, his conception of these attitudes, and his previously formed social habits. The hypothesis is that within a constant group a child assumes a certain rôle which continues to be relatively stable, at least over a short period of time.

The writer's interest in ascendant behavior in children was first aroused by observations in the preschool laboratories. The rôles assumed by the children in their play groups were soon evident and distinctly apparent. In view of this, it was surprising that a number of mothers interviewed in a previous study showed surprisingly little knowledge or concern about their children's habits of social behavior. In answer to a question of whether the child had a tendency to lead or submit to direction in his play group, almost every mother either said she did not know or that she believed her child tended to be a leader in his group. These experiences focused the writer's attention upon the type of behavior studied in this investigation.

CONCEPT OF ASCENDANCE

The concept of the actual type of behavior studied began with a very broad idea which included many types of behavior designed to raise the status of the child in his group and to further the pursuit of his own interests. In order to determine the patterns of such attempts among preschool children, a series of behavior records was taken. The following categories of behavior were identified by an analysis of these records:

1. Attempts to carry out own purposes and desires
2. Attempts to master a situation by:
   a. Directing the behavior of others
   b. Forcing own opinions or ideas upon others by emphasis, repetition, and insistence
3. Instances of force directed against the person of the companion, for whatever purpose
4. Attempts to gain recognition by:
   a. Performing before the group
   b. Directing attention toward self
   c. Indications of a competitive spirit, as shown in expressions of rivalry

Many of these components of the concept have been eliminated. A desire to perform before the group was left out because the tendency manifested itself in widely varying degrees in the different situations in which it was noted. Attempts to attract attention and expressions of rivalry were abandoned because the relation of these patterns to the others was uncertain. They might easily be attempts to compensate for failure in more direct attempts to secure higher status. Forcing another child to do something by actually hurting him physically put too great a premium upon mere size and physical strength. Attempts to force one's opinions and ideas upon another were not left in the developing concept for two reasons: identification of such attempts presented great difficulty and a child who was successful in his social relations would have less need of such tactics as repetition than the socially unsuccessful child. His attempts in this respect would, therefore, tend to be less obvious.

The types of behavior finally included in the concept are two: (1) pursuing one's own purposes against interference, and (2) directing the behavior of one's companions. It is difficult to find a term to describe such behavior. The term aggressive is defined as being on the offensive, with actual encroachment on the rights of others as a common connotation. It does not include the idea

of directing others' behavior; furthermore, we have no concern with the evaluation involved in the term encroachment. Leadership means the guidance of the activities of one's companions; it does not commonly convey the idea of looking out for one's own interests. The term which Allport's (3) study has brought into wide use is probably the best for our purposes. An ascendant individual, according to their use of the term, is one who acts in accordance with his own desires and places himself in a position of advancement. We shall use the term ascendant with some variations of our own, ascendant behavior including: (1) attempts to pursue one's own interests when they conflict with those of others and to direct the behavior of one's companions, and (2) success in these two types of attempts as indicated by compliance on the part of one's companions.

For our purposes, a child who makes few attempts to realize these ends is termed nonascendant, and a child who makes many attempts to realize one or both of these goals and is somewhat successful is ascendant.

PURPOSE OF STUDY

The primary purpose of this study has been to determine and to study some of the factors in the social behavior of children of preschool age who maintained a position of ascendance in the free play of their preschool groups. The study has divided itself into three steps, each of which may be considered subsidiary aims. These include attempts to: (1) devise tests for the measurement of ascendance within a play group of constant personnel, (2) make a preliminary survey of some of the concomitants of ascendance appearing in the children's social behavior, and (3) devise a series of situations designed to modify some of the factors in a play situation and determine the effects of these changes upon the behavior of a group of subjects whose scores show them to be nonascendant.

SUBJECTS USED IN STUDY

In the preliminary observation used for devising the test situations, three preschool groups of children two, three, and four years old were used. The four-year-old children far excelled the others in frequency of appearance of the patterns studied. This is in accord with findings of other studies. Goodenough's (13) study of interrelationships of behavior in preschool children aged

three to five years found an intercorrelation of .71 between age and social participation. This relationship between age and social participation is a significant factor. A study by Zalushni (quoted by Murphy (21)) of the formation of social habits in twenty-four children ranging in age from one to four years shows a comparison of specific social patterns and age which indicates decidedly more socially participative activity in the older children.

The subjects selected for the present study were four-year-old children in the preschool laboratories of the Iowa Child Welfare Research Station. Since the personnel of the subjects varied for different parts of the study, they will be described separately in connection with each section.

CHAPTER II

MEASUREMENT OF ASCENDANCE IN A PLAY GROUP OF CONSTANT PERSONNEL

For our purposes the method frequently used of sampling behavior in free play was not practicable for measuring ascendant behavior in a play group. If certain selective factors consistently determine the choice of companions of some of the children, as in the case of a child who constantly plays with a companion whom he can direct successfully, a sampling of their behavior does not provide a reliable index of their relation to the entire group. The interference of teachers in conflict situations, though infrequent in occurrence, is another disadvantage of observations in the group. Finally, the purposes for which the measuring device was planned, the experimental determination of the effect of changing certain factors, demanded a situation in which some factors might be varied and others held relatively constant while using the same type of behavior record.

The purpose was to provide a social situation that led to almost constant interaction between the children, thus constituting an efficient means of sampling social behavior. It was necessary that the situation keep the children in close physical proximity, be interesting to all the children, be as nearly like a natural play situation as possible, and provide a good opportunity for coöperative play.

EXPERIMENTAL SITUATION FOR THE MEASUREMENT OF ASCENDANCE

The materials used in the experiment for measuring ascendance included a wooden box, 18 by 36 inches, filled within a few inches of the top with sand. The box, situated on a table about 2 feet, 6 inches high, contained three groups of toys. Six celluloid farm animals were in one corner, a set of sand utensils including shovel, sifter, and two pans were in another, and a small metal car and a truck in a third. The experimenter, unknown to the children, looked through perforations well above their heads and recorded

their behavior from behind this screen. The diagram of the arrangement of the room during the experiment shows that the children would be most likely to face the experimenter. (Figure 1)

The situation used was decided upon after preliminary exploration to determine the type of situation that would provide the best sample of interaction and coöperative play. The children were allowed to play in pairs with combinations of various materials, and

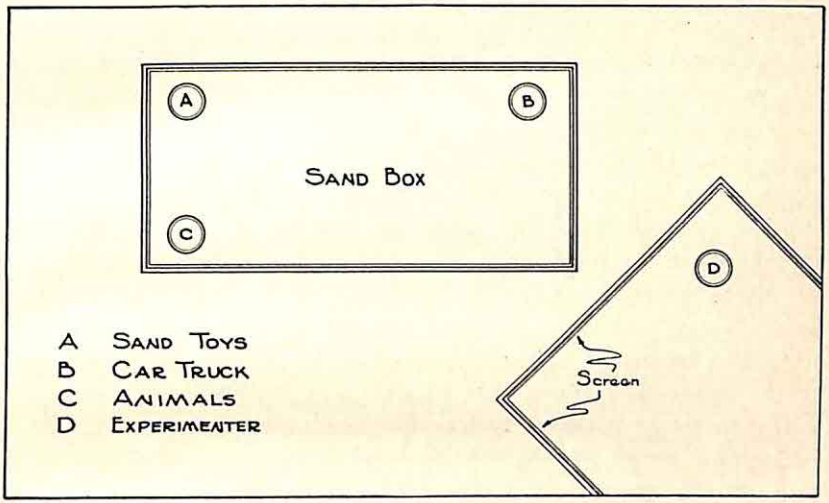


Figure 1. Arrangement of Observation Room During Experiment

records of instances of interaction, participation, and direction appearing in their behavior were secured by the hidden observer. Analysis proved a series of related toys, such as several farm animals, much more conducive to coöperative play in terms of the numerical frequency with which evidences of it occurred than a heterogeneous selection of unrelated toys. This experimental situation is called the ascendance experiment throughout the study.

SUBJECTS IN ASCENDANCE EXPERIMENT

The subjects used in preparing and evaluating the device for the measurement of ascendance and in the comparative analysis of behavior described in Chapter III were eighteen children, consistent in attendance, in the four-year-old preschool group of the Iowa Child Welfare Research Station during the year 1931-1932. Their ages and IQ's are summarized below. The chronological ages, given

in months, are those for the month in which the ascendance scores were taken. Most of the IQ's listed were obtained from Stanford-Binet tests given within a month of that date.

	Range	Mean	Standard Error of Mean
Chronological Age	45 to 57	51	3.24
Intelligence Quotient	95 to 154	125	15.25

The parents of the children were a group whose educational and occupational status was well above that of the average population. Of the fathers, every one had at least a high school education, ten had finished college, and seven of the ten had five or more years of college. Of the mothers, only two had no college training, while eight had a full college course or more. Of the fifteen fathers who were living and with their families, one was a student, five were merchants in the town, and nine were professors or instructors. Of the three mothers engaged outside their homes, one was employed in a university dormitory, one a student, and the other an instructor. The mean age of the fathers was thirty-nine, the range from thirty-two to fifty-four. The mean age of the mothers was thirty, with the range between twenty-four and forty-four years.

Another group of subjects was used in one phase of the preparation of the measuring device. It was essential to establish the reliability of the experimenter in obtaining the ascendance scores before any use was made of the scores. A different group of subjects was needed for this purpose. Twenty children from the three-year-old preschool group were used in this part of the study.

PROCEDURE FOR ASCENDANCE EXPERIMENT

Each child in the experimental group was paired serially with ten other children in the preschool group. Using a phrase familiar to all the children in the preschool, the experimenter asked two children to come with her for a "game." As she led the children into the room the experimenter said, "Here are some toys for you to play with until I come back and get you. We will keep them in the sand box all the time, but you may play with anything you want to."

Each observation period was five minutes in length. The pairings were determined by alphabetical arrangement of the names, with such occasional variations as were made necessary by con-

tinued absences. This number of pairings proved to be sufficient to place the subjects quite consistently in relation to the group, as will be indicated later in the chapter.

Types of Behavior Included in Ascendance Scores

In accordance with the definition of ascendant behavior adopted, the types of behavior comprising the ascendance scores were:

1. Verbal attempts to secure play materials
2. Forceful attempts to secure play materials
3. Succeeds in securing play materials
4. Defends, snatches back materials taken from his possession
5. Verbal attempts to direct behavior of companion
6. Companion complies with direction
7. Forbids, criticises, reproves companion
8. Provides pattern of behavior which companion imitates

In describing and defining the types of behavior studied, the matter of evaluation was continually appearing. An attempt was made, to cite one recurrent example, to differentiate between fair and unfair behavior in property conflicts. It appeared desirable, however, to avoid evaluation altogether and to make no attempts to differentiate between justifiable and unjustifiable behavior.

As an initial step in establishing the reliability of the behavior records, a set of specific definitions and limitations of each item was made by using the record blank simultaneously with another observer. Clarification of the definitions of the items causing confusion was attempted after each of these observations. The final list of definitions follows:

1. Verbal attempts to secure play materials
   Demands or asks for toy or play materials (including the right to use the sand in the box or in a certain part of the box). Includes any statement of desire for something in possession of companion and modifications such as, "Can't I have it if I'll give it back in just a minute?"
2. Forceful attempts to secure materials
   Attempts to get toy or play materials (including certain position at or certain portion of the sand box) from companion. Includes attempts to take material even when companion has laid it down close to him, but is obviously retaining it in his immediate possession. It includes, also, reaching for material even when the hands do not come into actual contact with it before it is snatched away.
   (When 1 and 2 occur simultaneously, only item 2 is counted.)

(Forceful accompaniments to attempts to get materials or to enforce other demands, as hitting and kicking, are not included.)

3. Succeeds in securing material from companion's possession
4. Defends, snatches back materials taken from his possession
   Holds on to toy he has and resists attempts to take it; snatches it back from companion who has taken it from him. Item 4 is counted even when the companion ultimately succeeds in getting the toy, but is counted only once for each attempt to take material from a child.
5. Verbal attempts to direct behavior of companion
   Suggests activity for his companion, either individual or coöperative. This includes any statement for companion's activity beginning with "Let's" or suggestion in form of a question as "Shall we—" It includes, also, apportionment of toys to companion with or without verbal accompaniment (such statements as "Do you want me to pour some sand into your truck?") and activity on the part of the companion or the use of some of the materials in his possession.
   Such vocalization as "Eeee" when obviously directing companion to stop doing something is also included.
   Items not included are: such statements as "Let's cover him up" when the companion is already engaged in the suggested activity; instances when the child may help his companion with something in order to show him how to do it, although there is no verbal accompaniment to indicate that this is the reason.
   Such verbal accompaniments to activity as "Now we'll turn the pie over," which occur with frequency but are obviously merely the child talking to himself.
6. Companion complies to direction
7. Forbids, criticizes, reproves companion
   Tells companion he should not do something; scolds companion
8. Provides pattern of behavior which companion imitates
   This is counted only when there is repetition of the speech or other behavior of the companion, the pattern being repeated in sufficient entirety to be plainly recognizable. Only one repetition of the same pattern is counted. This does not include joining companion with a song, chanted phrase, etc.

Method of Recording Behavior

It was found possible to take reliable records on both children in the paired situation at the same time. The blank upon which the records were taken is reproduced in its final form.

Form II
Jack
1931-32

Date .....
Group .....
Observer.....

Record of Ascendant Behavior
Iowa Child Welfare Research Station

Subject A.....
Subject B.....

		A	B
1.	Verbally attempts to secure materials	.....	
2.	Forcefully attempts to secure materials	.....	
3.	Succeeds in securing materials	.....	
4.	Defends, snatches back materials	.....	
5.	Verbally attempts to direct c's behavior	.....	
6.	Companion complies with direction	.....	
7.	Forbids, criticizes, reproves companion	.....	
8.	Provides pattern which companion imitates	.....	
9.	*Expresses rivalry	.....	
10.	*Calls attention to his accomplishment, etc.	.....	

* Items 9 and 10 were not included in the ascendance score.

RELIABILITY AND VALIDITY OF ASCENDANCE SCORES

To determine the reliability of the experimenter, the scores obtained by the writer were compared with those obtained independently by another student. After some preliminary work, the per cent of agreement of the scores obtained by the two was determined on twenty consecutive experiments, including records of 120 minutes of behavior. Agreement was determined by the formula:

$$\frac{\text{number of agreements}}{\text{total number of items checked}}$$

In case the totals were not equal on the records of the two experimenters, the higher of the two totals was used as the denominator. The per cent of agreement was computed for each separate experiment and the average obtained. The average was .96 ± .03.[1]

In determining the reliability of the ascendance scores themselves, or the consistency with which the behavior that is measured occurs, we find the coefficient of correlation between the odd and even halves of the ten partial scores to be .67 ± .10.[2] This is

1 The reliability of the per cent of agreement was computed by the formula $.6745\sqrt{\frac{fp\ (100 - fp)}{N}}$ found in Holzinger (15, p. 243).

2 With this exception, correlations obtained by the rank difference method have been used throughout the study.

brought up to .80, the reliability of the device, by the application of the Spearman-Brown prophecy formula.

The problem of establishing the validity of such measuring devices as the one just described is peculiarly difficult. Criteria that are completely satisfactory do not exist in the field of social behavior. The best available method for estimating the validity of the device was to determine the relationship between the results obtained by its use and the scores of a series of ratings. This has the limitations recognized for ratings as reliable criteria.

RATING SCALE

A scale was constructed in which the subject is ranked according to the frequency of the appearance of specific types of behavior, rather than one in which he is rated according to the degree to which he possesses a so-called trait. The scale included, in general, the same types of behavior as those included in the experimental situation. A five-point scale was used, indicating the frequency of the occurrence of various patterns of behavior in the subject with reference to the average of that particular group. The rating scale with the directions given each rater follows:

Directions for Raters

Please make these ratings on the basis of the group being considered. A child who insists upon his own rights to play materials in a decidedly greater number of situations than the average of his preschool group is scored 1, the child who is typical of the norm of the group in the appearance of that pattern is scored 3, the child who is noticeably lacking in this respect when compared to the group as a whole is scored 5.

By arranging these blanks in a horizontal row, overlapping each other across a table, item 1 may be checked straight through the list for each child before item 2 is considered. The rater is asked to do the checking in this manner in order to avoid, in so far as possible, the "halo effect" that is likely to color the ratings on a particular child.

Date .....
Subject.....
Rater.....

1 decidedly more than the average of the group
2 somewhat more than the average of the group
3 with a frequency about equal to the average of the group
4 somewhat less frequently than the average of the group
5 decidedly less frequently than the average of the group

Please encircle the appropriate number

1. Insists upon his own rights to play materials
   1 2 3 4 5

2. Challenges the property rights of others
   1 2 3 4 5
3. Initiates activities that include his companions
   1 2 3 4 5
4. Directs the activities of his companions
   1 2 3 4 5
5. Submits to direction from companions (1 denotes most submissive)
   1 2 3 4 5
6. Tries to help enforce group rules
   1 2 3 4 5
7. *Calls attention of teacher to his products, activities, possessions
   1 2 3 4 5
8. *Calls attention of companions to products, activities, possessions
   1 2 3 4 5
9. *Has rivalrous attitude; challenges or attempts to surpass companions' statements, activities
   1 2 3 4 5

* Items 7, 8, and 9 were not included in the final score used.

The three teachers in the group, working independently, rated each subject. The rating score was a composite of the three. The correlation between the ascendance scores and the composite ratings proved to be .81 ± .01 (rank difference).

SUPPLEMENTARY EXPERIMENTAL SITUATIONS

The concept of ascendance as used herein comprises two general types of behavior. Two supplementary experimental situations were devised, each designed to measure one of the two general types of behavior. A property rights experiment was selected as the best means of determining the tendency to pursue one's own interests against interference. The other experiment was designed to measure the tendency to direct the behavior of others.

Property Rights Experiment

Experimental Situation.—In the situation in which the right to play materials was the issue, two children were asked by the experimenter to come with her for a "game," and were taken together into a room in which there was a single toy. This situation is similar to one used by Walker and reported by Thomas and Thomas (27). Experimentation with various types of play materials indicated that probably no one situation of this type could be used to secure a reliable index of the child's behavior in regard to his property rights. The final property experiment, therefore, took the form of a series of five situations in which the

subject had a different companion, selected at random from the group, and a different toy in each experimental period. The five toys used were a toy telephone, a very life-like rabbit that could be made to jump, a marimba, a paper punch with colored cardboard to punch, and a toy aeroplane. The time was four minutes for each experimental period. In each situation the experimenter recorded behavior from behind a screen so that the children were unaware of being observed.

Motivation toward conflict would seem to lie in the attractiveness of the toys. This attraction was assumed to be equal for the two subjects without any real justification. The toys were not commonly used by any of the subjects with the exception of the telephone, and they never seemed to tire of it. Their behavior indicated interest in the toys throughout the series.

Some justification is necessary for the practice of changing the toy for each experiment in the series and thus changing two variables, the toy and the companion, at the same time. The preliminary experimentation showed that the children tired so quickly of any one toy that the competition for it decreased markedly after one or two periods. It seemed wiser, therefore, to secure different toys that appeared to be similar in the degree of interest they held for the subjects.

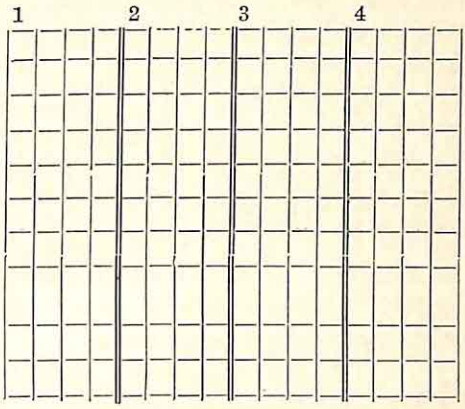
Subjects.—The subjects used in testing the value of this device were the eighteen four-year-old children described earlier in the chapter. Each child in the group was paired with five other children, pairings being selected at random from the group.

Scoring Method.—The record blank used in this experiment appears below. Records were taken on both subjects in the pair at the same time. Records in time units were taken by recording A or B on Possession of Toy, according to which possessed the toy at the beginning of the time unit. The four-minute period was divided into fifteen-second intervals, so sixteen records of possession of the toy were obtained in each experiment. Behavior items were merely checked A or B on the line designating the proper pattern of behavior.

Total scores were based on two types of items: the time the subject was in possession of the toy in time units, and the number and success of his attempts to secure it in behavior units. The scoring system was so arranged that the highest score made by any subject

Subject A..... Date.....
Subject B.....

1. Possession of toy
2. Asks for toy
3. Commands c to give toy
4. Suggests bargain
5. Appeals to fairness
6. Complies
7. Reaches for toy
8. Tries to take toy against defense
9. Pushes, hits, to get toy
10. Succeeds in getting toy



in attempting to secure the toy was no greater than the score that could be made by a child who kept the toy the full time and made no other scores. To accomplish this, each time unit counted two points in the total score; each behavior unit, or each occurrence of items 2 to 9 on the record, counted one point.

Reliability and Validity of Property Rights Experiment.—The reliability of the experimenter was determined in terms of the per cent of agreement by comparison of the results obtained by two independent experimenters. It was computed on sixteen consecutive records, covering a total of a little more than an hour's time. The per cent of agreement was calculated separately for the time units and the behavior units. It proved to be .96 ± .03 for the recording of possession of the material in time units, and .90 ± .05 on the behavior units.

An indication of the validity of the experiment is given by its correlation of .86 ± .04 (rank difference) with teachers' ratings on items concerning rights to property (i.e., items 1 and 2) in the rating scale described earlier in the chapter. The scores on the total property rights experiment show a correlation of .88 ± .04 (rank difference) with the ascendance scores.

Directing Experiment

Experimental Situation.—Attempts to plan a situation which would be conducive to continuous coöperative play and to attempts to direct others' behavior resulted in the selection of a situation including a small table with a chair on either side and a doll on

each chair. On the table was a set of doll dishes, two plates, cups, saucers, glasses, and spoons. The children were asked to go for a "game" and were taken in pairs by the experimenter who left them with no word of direction except that they might play in the room for a few minutes. This situation invariably produced co-operative play in which direction of one child was frequently attempted by the other. Each child in the group was placed in the directing experiment with a different companion five times, five minutes at a time.

Subjects.—The subjects used for this experiment were the eighteen four-year-old children used in the ascendance experiment and the property rights experiment. Each child was paired with five other children in the group; pairings were selected by an alphabetical arrangement of the names.

Scoring Method.—The blank upon which behavior was recorded is reproduced below. Items were recorded exclusively in behavior units. The appearance of each pattern of behavior was noted on

Directing Experiment

Subject A..... Date.....
Subject B.....
Suggests..... Complies.....
Commands..... Makes counter suggestion.....
Reproves..... Provides pattern for imitation .....

the proper line by the use of A or B.

Definitions of the patterns recorded as suggestions or commands included all verbal suggestions of a specific activity for the companion, whether it suggested an entirely new course of behavior or a modification of the pattern in progress. Suggestion of an activity already in progress, however, was not counted. It was assumed to have been made for the purpose of allying the child making the suggestion with the activity or with his companion.

In addition to the attempts to direct, included under commands, suggestions, reproval, or counter suggestions, another pattern of behavior was counted as an attempt to determine the behavior of the companion. This was arranging the companion's play materials or allotting the materials out to him. Such behavior was listed as an instance of suggesting behavior whether or not it was accompanied by verbal directing.

Only the repetition of a practically exact pattern was recorded

as imitation, and this only when the repetition was immediate or almost immediate. No doubt a number of actual imitations were missed but it seemed the only way to reduce subjective judgment on this item. Every repetition of the act of a companion was counted as a separate imitative item. For example, if A fed his doll first with a spoon and B did the same with his, and A fed his doll with the cup and B followed him in this as well, A was credited with providing a pattern that was imitated by B two separate times.

Each item of behavior on the record blank was scored one point for the child who made it, except that "Complies" marked for one child counted one point for his companion.

Reliability and Validity of Directing Experiment.—The reliability of the experimenter was computed on twelve consecutive five-minute experimental periods, a total of one hour's time. There was agreement between two independent experimenters on 91 per cent of the items recorded, the actual per cent of agreement being .91 ± .05. The scores on the directing experiment show a lower degree of validity, as estimated by their agreement with teachers' ratings, than those on the property rights experiment. The combined ratings of three teachers on items 3, 4, 5, and 6 in the rating scale described earlier in this chapter correlate with the directing scores .76 ± .07 (rank difference). The scores on the directing experiment show a correlation of .70 ± .08 (rank difference) with the ascendance scores.

Value of Property Rights and Directing Experiments

No further use was made in the study of these two experiments, the property rights experiment and the directing experiment. They are presented here, however, because it is of interest to note that each of these types of behavior, when considered alone, was measured with fair reliability in a decidedly shorter period of time than was necessary to secure the total ascendance score.

INTERRELATIONS OF VARIOUS CRITERIA

Three of the criteria for differentiating between the subjects which are described in this chapter—the ascendance score, the ascendance rating, and the directing score—place the subjects in the same third of a rank order with little error. Table 1 presents the scores for each subject as obtained by these three devices sep-

arately, and a combined score representing the total of the three sets of scores. The ascendance scores and the combined scores place the subject in exactly the same groups in a threefold division. It may be noted that in no case is a child found in the upper third by one criterion and placed in the lower third by another. The subjects as listed in Table 1 are divided into ascendant, moderately ascendant, and nonascendant groups as differentiated by the ascendance scores.

Table 1

Scores For Eighteen Subjects on the Ascendance Experiment, the Rating Scale, and the Directing Experiment, and a Combined Score Representing the Total of the Three Types of Scores

Subject	Ascendance Score	Ascendance Rating	Directing Score	Total Scores By Three Criteria
		Ascendant		
M533	102	59	29	190
F740	95	56	28	179
F734	84	64	40	188
M606	82	59	30	171
F558	63	54	37	154
M738	61	49	24	134
Mean	81.16	56.83	31.33	169.33
		Moderately Ascendant		
M544	60	49	7	116
F739	57	44	19	120
F737	52	45	21	118
M651	47	45	14	106
F756	44	52	19	115
M557	44	49	24	117
Mean	54	47.33	17.33	115.33
		Nonascendant		
M735	39	30	7	76
F707	36	30	5	71
F729	34	37	14	85
F755	31	35	12	72
F652	28	45	24	97
M678	15	32	13	60
Mean	30.50	34.83	12.5	76.83

SUMMARY AND RESULTS

An experimental situation, comprising a series of ten pairings of each subject, was used for the measurement of ascendant behavior. Scores obtained by this device, called the ascendance scores, were secured by two independent experimenters working simultaneously. The scores showed an agreement of 96 per cent (.96 ± .03). The ascendance scores showed a self-correlation between odd and even halves of .80 (after the application of the Spearman-Brown prophecy formula). The composite rating of the subjects secured by the combination of the ratings of three teachers showed a correlation with the ascendance scores of .81 ± .01 (rank difference).

An experimental situation designed to measure the degree to which a child pursues his own course against interference, as indicated by his behavior in a situation involving property rights, was devised. Total property rights scores were a combination of scores in time units and in behavior units. Scores obtained by two independent experimenters showed a per cent of agreement of .90 ± .05 in recording behavior units and .96 ± .03 in recording time units. The total scores on the property rights experiment correlate .86 ± .04 (rank difference) with teachers' ratings. The scores correlate .88 ± .04 (rank difference) with the ascendance scores.

In an experimental situation for the measurement of direction of the behavior of others, the scores obtained by two independent experimenters showed a per cent of agreement of .91 ± .05. Scores on the directing experiment correlated with teachers' ratings .76 ± .07 (rank difference), and .70 ± .08 (rank difference) with the ascendance scores.

Scores obtained by the ascendance experiment, by the ascendance ratings, and by the directing experiment place the subjects quite consistently in the same third of a rank order, although their order within these groupings varies considerably according to the three criteria.

CHAPTER III

RELATIONSHIP OF CERTAIN PATTERNS OF SOCIAL BEHAVIOR TO ASCENDANCE IN A GROUP OF PRESCHOOL CHILDREN

Certain individual factors have been assumed by a number of students to have a direct relation to ascendant behavior and to the related type of behavior, leadership. These factors most commonly include age, size, intelligence, physical appearance, and, in fewer cases, vitality. All have been found to be positively correlated with leadership, but the extent of the relationship has varied widely in the different studies.

A few studies have been done with the purpose of determining some of the factors in environment and in behavior that are related to leadership in children. They include Adelberg's (1) study of the characteristics of a child leader, Woolley's (32) case study of "Agnes, a Dominant Personality in the Making," and Van Waters' (30) study of the home training of a group of girls who were leaders. Two German studies are those of Leib (17) who studied the qualities, many of them social, observable in child leaders, and Reininger's[3] study which resulted in a classification of social types among children.

The purpose of this section of the present study is to see what features can be found in the social behavior of the ascendant children that seem to be concomitants of ascendancy. The aim is to discover factors in the behavior of the ascendant children that differentiate them from nonascendant children so consistently as to be worthy of intensive study. The methods used are essentially cross sectional rather than genetic in their nature.

SUBJECTS AND PROCEDURE

Two groups of four-year-old children, eighteen children in one

[3] Reininger, K.: Das soziale Verhalten von Schulneulingen. (Wien. Arb. z. päd. Psychol., No. 2.) Vienna: Deutscher Verlag f. Jungend u. Volk, 1929. Pp. 84. Cited by Bühler, Charlotte: The Social Behavior of the Child. [In] Murchison, Carl [editor]: A Handbook of Child Psychology. Worcester, Mass.: Clark University Press, 1931. Pp. xii, 711. (p. 392-431)

and twenty in the other, acted as subjects for this part of the study. The first, the experimental group of eighteen children described in the beginning of Chapter II, was divided into three sections in terms of the ascendance scores. The six children with the highest scores, called hereafter the ascendant group, had a mean score of 81.16; the six children with the lowest scores, called the nonascendant group, had a mean score of 30.50; and the six with scores between these two groups, called the moderately ascendant group, had a mean score of 54.00. This gives a mean difference between the ascendant and nonascendant groups of 50.66, with a standard error of the difference 6.29. The two groups, then, are significantly different in the degree of ascendance which they show in terms of these scores.

Measures of various characteristics of social behavior were made and the ascendant and nonascendant groups, as defined above, compared with respect to these characteristics. The types of characteristics that were studied included certain general characteristics of social behavior. The first of these, social responsiveness, was determined by a series of controlled observations in the play group. Expansive behavior in the group was measured by a series of observations in the daily story group. The degree to which the children were amenable to adult control was determined by an experimental situation. The frequency with which the subjects exhibited two other patterns of behavior, a competitive attitude and a tendency to draw attention to their accomplishments, was determined by records of behavior taken in a controlled situation.

The types of immediate, direct techniques used by the subjects in controlling the behavior of others were studied through analysis of records of behavior in the play group. Records totaling one hour of time spent in active participation in play with other children in the play group were secured on each subject. These records were analyzed and the frequency of the use of certain types of techniques of control determined. The ascendant and nonascendant groups were also compared with respect to the frequency of their use of these various methods of control.

Twenty children in the four-year-old group in the preschool laboratories during the summer of 1932 were used as subjects in the final part of the comparative analysis. Behavior records of socially participative activity in the play group were taken on each subject in this group. The records were analyzed for the

occurrence of overt signs of self-confidence, and the ascendant and nonascendant sections of the group compared in this respect.

RELATION OF CERTAIN GENERAL CHARACTERISTICS OF SOCIAL BEHAVIOR TO ASCENDANCE

Social Responsiveness

Extroversion has been found by Bender (5), Brown (8), and Caldwell and Wellman (9) to have a positive relation to leadership. Beyond the differences in in-directed and out-directed interests, expressed in introversion and extroversion, however, there is a difference in children in their interest in people (i.e., interest in the responses they can elicit and the notice they can get). Thurstone (29) finds four "general factors" in the interests of individuals that are apparently active in determining their occupations. One of these is interest in people. Bonham and Sargent (7), applying a scale of social and emotional reactions to newborn infants and repeating it between two and two and one-half years later, found "sociability" to be one of the few characteristics that showed fair consistency between early and later scores.

Various criteria of sociality have been suggested. Gregg, Miller, and Linton, in a study reported by Thomas (26), mention a multiple criterion for "social responsiveness" based on the fact that, among their subjects, all children who showed largest numbers of social contacts in a total of sixty minutes of observation were above average in the frequency of the use of laughter. Their study, primarily a study of laughter, assumed that pattern in itself to be an indication of "social awareness." Other writers have used talkativeness as an index of sociality. Barker (4) has a technique for comparing children's interest in people and in material objects by comparison of the frequency of social and material contacts. For our purposes, the measurement of social responsiveness was undertaken in terms of five criteria: (1) playing with the same material as another child and within three feet of him, (2) smiling at another child, (3) looking at another child and showing response to him in facial expression, (4) touching another child (excluding obviously accidental bumping), and (5) talking to another child.

Short time samples were used. During an observation two minutes in length, tabulations indicating the occurrence of responsive behavior were made for each ten-second interval on a prepared

record blank. The appearance of socially responsive behavior was noted only once within each time interval. Twenty-two records were taken on each child, the subjects being observed in an alphabetical order sequence. A total of 440 observations was recorded for each subject. A reliable measure of social responsiveness can, it appears, be secured in this number of observations. The self-correlation (rank difference), odd against even scores, proved to be .94 ± .02.

Raw scores in social responsiveness for each subject, arranged in ascendant, moderately ascendant, and nonascendant groups, appear in Table 2.

Table 2

Social Responsiveness Scores for Ascendant, Moderately Ascendant, and Nonascendant Groups in Number of Time Units in Which Subject Was Responding Socially

Group					
Ascendant		Moderately Ascendant		Nonascendant	
Subject	Score	Subject	Score	Subject	Score
M606	173	M557	162	M678	125
F 734	143	F 737	138	F 755	117
F 558	143	M651	162	F 729	56
M738	181	F 756	154	M735	71
M533	187	F 739	110	F 707	76
F 740	170	M544	105	F 652	138
Mean	166.17		128.5		97.17

The average child in the total group of eighteen children was responding socially during 47 per cent of the time units recorded. The average per cent of time the children in the three groups were responding socially were: ascendant, 63 per cent; moderately ascendant, 46 per cent; and nonascendant, 28 per cent.

Considering the mean number of time units in which the children in the ascendant group and those in the nonascendant group were responding socially, we find the mean score for the ascendant group was 166.17; for the nonascendant group, 97.17. The mean difference was 69.00 and the standard error, 11.90. The standard error of the difference is large, the number of cases being so small, but the ratio of the mean difference to the standard error of the dif-

ference still indicates a reliable difference between the two means.

The relationship between the two types of behavior as measured by the devices used in this study is indicated by the rank difference correlation of .65 ± .07 between the ascendance scores and the scores in social responsiveness.

Goodenough (13) found an intercorrelation of .98 between sociality and leadership.[4] She acknowledges, however, that the reason for this high relation is probably because the definitions of the two she used were too nearly identical. Parten (23, 24, 25) speaks of leadership as a "phase of social participation," in which she agrees with Folsom (12) who says that the "leadership score is roughly an index of participation." The data in the present study, on the other hand, would indicate that although a high degree of social responsiveness is a concomitant of ascendant behavior among these subjects, social responsiveness is not of necessity accompanied by ascendant behavior.

Expansive Behavior

Expansive behavior in the group was studied as it occurred in a story group conducted by an adult. It seemed likely that some relation would exist between the rôle the children held in the daily story group and their ascendant tendencies in the play group. In a series of observations taken for twenty consecutive days during a twenty-minute period when stories were being read to the children, three types of items were enumerated, including: volunteering a question, volunteering a statement or observation, and asking that a certain story be read. When totals for these three types of items were counted, the range of frequencies for the various subjects was extended from 0 to 127.

Among the lowest third of the total group in frequency of expansive behavior in the story group, one child was from the ascendant group, one from the moderately ascendant, and four from the nonascendant group. In the uppermost third in expansiveness the two with the highest scores were from the ascendant group, but of the four next in order three were from the moderately ascendant and one from the nonascendant group.

Little relation was shown, then, between the two types of behavior in this group. A rather specialized interest in stories seemed to operate as a factor of considerable importance. Two children,

[4] Both forms of behavior were measured by short samples of free play.

one from the moderately ascendant and one from the nonascendant group who ranked third and fourth in participation in the story group, were the two who spent more of their free play time with books than any other children in the group.

Response to Adult Direction

A third characteristic of social behavior used in the comparison of the ascendant and nonascendant groups was the response of the subjects to adult direction. This was measured by an experimental situation in which the suggestion made by the adult was designed to be in strong conflict with the behavior suggested by the situation itself.

The situation selected brought the child into a room where there was a low table. On the table was an aeroplane field of painted cardboard with a runway to the cardboard hangar, and a toy metal aeroplane at the end of the runway. The experimenter took the child to the table and said, "See this hangar? The aeroplane can run right into it, you see, and then it can turn on its wheels and run right out again." She demonstrated and started the propellor as she spoke, then moved back. The minute the subject's hands touched the aeroplane she took it saying, "But we're going to leave it over here, and this is for you to play with." She touched a tin pan on the corner of the cardboard field and took the aeroplane to another low table near the one on which the aeroplane field stood.

The adult in the experiment was the writer. Her authority over the children had in no case been an issue. She had asked them to go with her for "games" repeatedly and had directed them when they had gone with her to the extent that their attitude toward her was probably different from their attitude toward a strange adult. To obtain conclusive results, it would be necessary to determine the responses of the children to different adults in comparable situations.

In this experimental situation it seemed that two forms of behavior, taking the aeroplane and refusing to stay in the room a second, should be scored decidedly higher than any others in indicating lack of subservience to adult control. The arbitrary scoring weights assigned the various items that appeared in the records were worked out as follows:

Score	Item
20	Takes aeroplane
15	Leaves
5	Asks for aeroplane
	Says will leave, etc., if not given aeroplane
	Fingers, touches aeroplane; takes it up but immediately replaces it
3	Says doesn't want to play with pan, the pan doesn't go with hangar, aeroplane should go with hangar, doesn't like game, wants to go
	Asks when he can go, if he can have aeroplane later
2	Asks what pan is for
1	Talks to experimenter
	Plays with experimenter's apparel, fingers her watch, etc.
0	Does nothing
	Plays with pan as directed

The appearance of each of the patterns scored 5, 3, or 2 was given its allotted score each time it appeared up to three times; remaining occurrences were given only 1 additional point.

The scores on this experiment, called the adult direction scores, do not give evidence of the existence of a close relation to ascendant behavior in this group. The scores on the adult direction test are presented in Table 3 for the subjects divided into the three original groups according to ascendance scores. The correlation between adult direction scores and ascendance scores was .56 $\pm$ .12[5] (rank difference). It is true, however, that all of the highest scores are found in the ascendant group and that the only children who did not actually conform to the experimenter's directions, those who either took the toy or refused to stay, were from the ascendant group. Attitudes toward adult authority are very specific phases of behavior; the relation between the two patterns, ascendance and submission to adult direction, which these scores indicate is probably as close as might be expected.

It is undoubtedly true that the home environment is one of the significant factors in the development of the characteristic in which we are interested. The group of children with whom this study was conducted, however, was too homogeneous in its background to use for the study of this variable. A survey of brief statements made by the parents concerning the methods of discipline used with the children showed a very general and practically exclusive

[5] This correlation is spuriously high because of the number of zero scores.

use of methods generally conceded to be desirable—reasoning and explaining, isolation, deprivation, and substitution.

Table 3

Adult Direction Scores, Subjects Divided Into Ascendant, Moderately Ascendant, and Nonascendant Groups

Group					
Ascendant		Moderately Ascendant		Nonascendant	
Subject	Score	Subject	Score	Subject	Score
M606	20	M557	0	M678	3
F 734	6	F 737	5	F 755	0
F 740	0	M651	4	F 652	0
M533	20	F 739	0	F 729	0
M738	6	M544	0	M735	5
F 558	20			F 707	0

A Competitive Attitude Indicated by Expressions of Rivalry

The record blank used in the ascendance experiment described in Chapter II included records on two types of behavior that were not direct signs of ascendance according to our final definition, and were not included in the ascendance scores. These forms of behavior, both of them verbal, were expressions of rivalry and claims for attention. The frequency of occurrence of these two patterns of behavior was secured from the records taken during the ascendance experiment in which each of eighteen subjects was paired with ten other children and their behavior recorded for five-minute periods. The reliability with which the records were taken, secured by comparison with another student working independently, was a percentage agreement of .94 ± .04 when the two items, expressions of rivalry and claims for attention, were included in the comparison. This agreement was determined on twenty consecutive records.

The definition used in recording "expressions of rivalry" was:

> Expressions of rivalry include any statement which shows, mainly by inflection and emphasis, that the child is expressing a comparison of his and his companion's states which is to his own advantage. It may involve possessions, products, knowledge, ability, etc.
>
> In cases in which a child makes a statement of fact seemingly to imply no comparison, to which his companion responds, "I have one of those too

and it's bigger than yours,'' or a similar statement, the second is counted as an expression of rivalry, while the initial statement is not.

The same statement is never counted as both a claim for attention and an expression of rivalry. If an element of rivalry is included in the statement, it is listed as rivalry.

The relation of this form of behavior, as measured, to ascendance in the subjects was determined by comparison of the frequency of its occurrence in the ascendant and nonascendant groups. The totals for the two groups show exactly twice as many expressions of rivalry made by the children in the ascendant group as made in the nonascendant group, the totals being fifty to twenty-five.

Verbal Claims for Attention

The definition used in recording ''claims for attention'' was:

Calls attention to what he is doing or has done. Does not include any verbal accompaniment to activity such as ''Now they're all in a row,'' ''Now the truck's going to dump'' unless subject indicates definitely by looking directly at companion that he is pointing out that activity to him. (This was very strictly interpreted.)

Does not include times when child calls attention to a characteristic of something he has for which he is not responsible. For example, ''See, the dog has two pink eyes'' does not count as a claim for attention.

The forms of behavior actually motivated by the desire to get attention are innumerable. None were considered here except those that unquestionably had that purpose as, ''Watch what I'm going to make the horse do now.'' As enumerated in the records, the number of such statements was almost equal for the two groups being compared, totaling thirty-seven for the ascendant group and forty-two for the nonascendant group.

RELATION OF ASCENDANCE OF THE TYPE OF IMMEDIATE, DIRECT TECHNIQUES USED IN ATTEMPTS TO CONTROL BEHAVIOR OF OTHERS

In an attempt to determine some of the concomitants of ascendant behavior, it seemed that it would be of value to see what differences exist between the ascendant and the nonascendant children in the actual, direct techniques they use in attempts to control the behavior of their companions. Several factors previously mentioned may be considered techniques of control, but only in a very indirect sense. The emphasis in this case was on the immediate methods assumed to be conscious attempts to control the behavior of others.

The material presented in this section of the study was secured

by the analysis of behavior records of free play in the preschool group for the four-year-old children described in Chapter II. The records were taken by the writer in shorthand in the form of running notes. The subjects were rotated in alphabetical order. Records were taken on each child in his turn, if he were engaged in what was called social participation. The criteria for such behavior were that the child observed be: (1) actually playing the same game as another child, (2) centering his efforts on the same aim or object as another child, or (3) directing or being directed by another child. These categories obviously overlap. As soon as the child being observed ceased to be participating socially with another child, the subject next in order was taken. It was necessary to return to the children who were the least responsive socially many more times than to the others in order to secure a total of one hour's record on each subject.

Three characteristics of the children's attempts to control others appeared in the analysis of the behavior observed: (1) the type of suggestion, (2) the accompanying verbal content of the suggestion, and (3) the accompanying use of force. The types of suggestions fell into four categories: (1) commands, (2) questions, (3) suggestions beginning with "Let's," and (4) positive statements. A command included everything in the imperative mode, with the one exception noted below. A question included every suggestion containing a question at any point. For example, any suggestion ending with "Shall we?" or "Do you want to?" was listed as a question. The third class included all suggestions beginning with "Let's." This class was separated from the others on the assumption that the suggestion of coöperation which it implied might be significantly different from the other forms. The fourth category included suggestions in the form of positive statements as "This will be our front door."

The five categories under which accompanying verbal content were listed included bargains, threats, reproofs, statement of reasons for the suggested activity, and repetition. A suggestion was not counted as a repetition if it had been made once, answered, and repeated in the same or a different form; it was counted only if it had called forth no response previously. The use of physical force was listed as: (1) force applied to materials in getting something from the other's possession; (2) force applied to the companion's person in pushing, pulling him, or in hitting, kicking, or

otherwise hurting him to force him to submit; and (3) force used in retaliation, in which that directed against materials or persons was all counted together.

The observation records for each subject were analyzed and the frequency of occurrence of each of these types of behavior listed. The subjects in the ascendant and nonascendant groups were compared as to the frequency with which they used these various techniques. The frequency of the four types of suggestions used by the two groups is compared below:

Type of Suggestion	Ascendant Group	Nonascendant Group
Command	162	59
Question	24	35
"Let's"	12	6
Statement	99	31
Total	297	132

The total number of verbal suggestions for the behavior of others made by the children in the ascendant group was between two and three times as great as that made by the nonascendant children. In practically every case the actual number of occurrences of the various types of behavior was greater for the ascendant than for the nonascendant group. It is probably each group's use of these various techniques in relation to its total number of verbal attempts to control others that is significant for comparison. It is in this manner (i.e., as per cents of the total number of verbal suggestions for the behavior of others made by a group) that the frequencies of the use of each technique by the ascendant and the nonascendant groups are presented in the following tabulation:

Technique	Per Cent Made by Ascendant Group	Per Cent Made by Nonascendant Group
Command	55	44
Question	08	27
"Let's"	04	05
Statement	33	22
Bargain	01	03
Threat	03	00
Repetition	03	02
Reproof	02	05
Reason	06	06
Force (initiated)*	09	08

* This is excluding all uses of force in retaliation.

It is surprising to note the similarity of the proportion of the total that each type of suggestion forms in the two groups. They are quite nearly alike in the per cent of the total formed by commands, suggestions beginning with "Let's," and by statements. The only appreciable difference is in those phrased as questions, a form which the nonascendant group used between three and four times as frequently as the ascendant group.

Considering the verbal accompaniments and attempts at persuasion, bargains and reproof were used somewhat more frequently by the nonascendant group and threats more frequently by the ascendant group. Repetition and the use of reasons were almost equally characteristic of the two groups. It was surprising that the use of physical force was almost as prevalent, relatively, in one group as in another. There was some difference, however, in the varieties of the use of physical force. Considering the percentages of all uses of force, the following differences are found between the groups:

Force	Ascendant	Nonascendant
Directed against person	.53	.24
Directed against materials	.25	.35
Used in retaliation	.22	.41

The ascendant group used force directed against the person of a companion twice as often as the nonascendant, while the latter group used force in retaliation almost twice as often as the ascendant group.

The outstanding fact in the consideration of these techniques of control seems to be that the differences between the two groups are surprisingly small when viewed in relation to the number of attempts to control others. Granted that there were probably other differences that were not detected, it seems that differences between the children who do and those who do not attain an ascendant position in their group must be traced back to something other than their immediate behavior in the group. The differences may lie in factors that are somewhat independent of the immediate, overt situation, such as the prestige the child has established or the confidence he has gained in himself.

RELATION OF OVERT MANIFESTATIONS OF SELF-CONFIDENCE TO ASCENDANCE

In an attempt to discover some of the factors that act as spontaneous and immediate determinants of the status of individuals

when they first come into contact with others, a series of observations was made of twenty four-year-old children who were together for the first time in the 1932 summer preschool group. These observations, like the previous ones, were taken on the subjects rotated in order. Only socially participative behavior was recorded, as explained earlier in the chapter, but the observations did not represent equal amounts of time for the various subjects. The cues that determine the form this initial interaction takes among the children are so subtle that the search for them was abandoned. On going through the data, however, one outstanding difference between the ascendant and the nonascendant groups[6] became obvious immediately. This difference was the overt indications of the presence and the lack of self-confidence.

The manifestations of lack of confidence, or of what we may call social fear, that appeared in the records and seemed to be unmistakable and relatively free from the necessity for interpretation included:

Item	Description
1	Showing fear of companions' displeasure in facial expression
2	Appealing to adult for response, attention
3	Following, holding on to teacher, adult
4	Appealing to adult for help
5	Interfering with others' activities for no apparent reason, no advantage to himself, but only to secure attention
6	Starting to do something, hesitating, not doing it
7	Showing fear of physical objects (as slides, swings)
8	Showing loud, reasonless laughter and reasonless enthusiasm[7]
9	Reacting strongly to criticism, ridicule, and threats by blushing, apologizing, retreating

The frequency of appearance of these patterns in the behavior of the two groups is indicated below; the item numbers correspond to the listing in the above tabulation:

Group	Item									
	1	2	3	4	5	6	7	8	9	Total
Ascendant	1	2	0	0	2	2	6	0	4	17
Nonascendant	5	13	1	5	10	8	8	11	8	69

[6] There was not time to get ascendance scores on these subjects. As the best substitute, a composite score of three teachers' ratings made on the rating scale described in Chapter II was used to determine the ascendant and nonascendant group divisions.

[7] Obviously this item requires some interpretation. Only behavior that was outstanding in this respect, as hollow, forced laughter and enthusiasm of a very obvious nature, was counted as an example of this type of behavior.

The totals for the two groups show that almost four times as many of these manifestations of lack of confidence occurred in the behavior of the nonascendant children as in the behavior of the ascendant group.

Some objective indications of the presence of confidence were noted in the behavior of the children. These included:

Item	Description
1	Evidence of expecting compliance with a suggestion, as shown by a child going ahead and starting an activity he has suggested without waiting for the other's response
2	A tendency to make requests and suggestions in such form that they appear as a favor to the child to whom the suggestion is made
3	Disregard of ridicule, criticism
4	Rivalrous, defensive reaction to ridicule or criticism
5	Assumption of a protective attitude toward companions

These few evidences of confidence were present almost exclusively in the behavior of the leading group, the frequencies being:

Item	Ascendant Group	Nonascendant Group
1	3	0
2	10	1
3	3	0
4	11	0
5	3	0
Total	30	1

The writer's interpretation entered into the analysis of these observations and the selection of the types of behavior regarded as significant; therefore, the analysis had no proof of validity. The results do appear to indicate, however, that there are certain definite signs of the presence of and the lack of self-confidence that are obvious enough to be observed, and which differentiate quite clearly between the ascendant and the nonascendant children.

There is some overlapping in the meaning of the terms ascendance and self-confidence as they are commonly used. The items of behavior used as evidences of the two in this analysis are not, however, identical or even overlapping in any case.

SUMMARY AND RESULTS

Eighteen four-year-old children were ranked according to the degree of ascendance they showed when measured by the ascendance experiment described in Chapter II. The upper third of the

total group, called the ascendant group, and the lower third, called the nonascendant group, were studied comparatively with respect to certain characteristics of social behavior. These included social responsiveness and expansive behavior measured by a series of observations in the play group. Response to adult direction was determined by the use of an experimental situation. Two patterns, the tendencies to assume a competitive attitude and to draw attention to oneself, were measured by behavior records in a controlled situation.

Record of an hour's observation on each subject when he was engaged in socially participative activity was analyzed with respect to the immediate techniques used by the children in attempting to control the behavior of others.

Observations of participative play in the group were recorded on a second group of eighteen four-year-old children, and the records analyzed for the occurrence of signs of the presence of self-confidence.

The frequency of occurrence of these various patterns of social behavior in the ascendant groups was compared with that in the nonascendant groups with the following tentative results:

When the relation of ascendance in the experimental group to certain general types of social behavior was compared:

1. Every child in the ascendant group is well above the mean of the total group in social responsiveness as measured by short time samples. The correlation between the ascendance scores and social responsiveness is, however, only .65 $\pm$ .07 (rank difference).
2. Ascendance in the subjects was not closely related to expansive behavior in the story group.
3. Ascendance in the group showed a relation to the tendency to resist adult control as determined by an experimental situation. The relation, however, was not close; the correlation between the two types of scores is .56 $\pm$ .12.
4. Expressions of a rivalrous, competitive attitude occurred twice as frequently in the ascendant group as in the nonascendant group.
5. Claims for attention were about equally characteristic of the ascendant and the nonascendant groups.

When the relation of ascendance in the group to certain direct techniques for controlling the behavior of others was compared for the two groups:

6. Dividing the attempts to control others into four categories, commands, suggestions beginning with "Let's," positive statements, and questions, we find the first three forms of suggestions about equally characteristic of the attempts of the two groups. From three to four times as great a proportion of suggestions in the form of questions was made by the nonascendant group, however.

7. The use of verbal attempts at persuasion in terms of relative scores showed: (a) Bargains and reproof were used a little more frequently by the nonascendant group than by the ascendant group. (b) Threats were used more frequently by the ascendant subjects. (c) Repetition of the suggestions and presentation of reasons for the suggested behavior were used with nearly equal frequency by the two groups.

8. In proportion to the total number of attempts to control others, the frequency of use of physical force was almost equal for the two groups. The ascendant group, however, used force directed against the person of the companion about twice as often as the nonascendant group, while the latter used force in retaliation about twice as frequently as the ascendant subjects.

When the relation of ascendance in the group to certain overt manifestations of self-confidence was compared:

9. Analysis of behavior records showed that certain overt signs of confidence and lack of confidence differentiated quite clearly between the ascendant and nonascendant groups. Since cues of this nature formed the most outstanding differentiating agent in the social behavior of the two types of groups, it may be that they form a very considerable part of the factors determining the rôles of the children.

The chief conclusion to which these data appear to lead is that few social behavior traits have appeared that consistently differentiate between children who are typically ascendant and those who are typically nonascendant in a play situation. This is true even of the immediate techniques used by the children in their attempts to control the behavior of others. It seems to be a *sine qua non* of ascendance that a child be socially responsive. Beyond that, the chief difference found between the ascendant and nonascendant groups was in the frequency of appearance of overt, obvious manifestations of the presence of and lack of confidence.

CHAPTER IV

AN EXPERIMENTAL INVESTIGATION OF THE EFFECT OF CERTAIN FACTORS UPON ASCENDANT BEHAVIOR

There is little evidence of an experimental nature regarding the effect of changes in environmental factors upon social behavior. Clinical reports, observations, and biographical studies provide almost the only evidence. The method of changing some factors in the environment and measuring the effects of that change which has been used in the study of environmental effects upon the IQ has had little use as yet in the study of social behavior.

One of the few studies of this nature that have been made is Walsh's (31) study of the effect of nursery school training upon twenty-two children as compared with a control group of twenty-one. Using the Bonham-Sargent scale of behavior as a criterion, she found a greater change in the experimental groups than in the control groups in several characteristics. Among them were sociability, initiative, independence, good nature, orderliness, curiosity, self-assertion, self-reliance, sympathy, and willingness to talk. Moore's (19) study of the development of mental hygiene in nursery school children through purposeful activity showed positive results of the training given the subjects. A study including more than 300 children has been carried on at the University of California (33) in which half the group was subjected to the regular regimen of habit clinic and half used as a control. It was hoped that the value of the clinic procedures might be estimated by the comparison of the two groups.

TRAINING SERIES EXPERIMENTAL SITUATION

The present study is an attempt to limit the change in a social situation, as nearly as possible, to one factor and to determine the effect of this change. The series of attempts described in the previous chapter to find out what characteristics of social behavior differentiated ascendant and nonascendant children revealed few outstanding differences. One prominent factor was the difference

between the two groups in their manifestations of confidence. An attempt was made, therefore, to determine the effect of placing nonascendant subjects in a situation the very nature of which would tend to make their position more secure and to assure them of a certain degree of confidence. The actual, measurable change in the situation was made in providing the subjects with a certain skill or ability not achieved by their companions. This involved some attendant changes of a less tangible nature.

A series of situations was arranged, each involving one certain knowledge or ability. Each subject was placed in the experimental situation with the experimenter a number of times before he was placed in it with another child. By virtue of his previous experience, he knew what to expect, recognized the materials, and knew what to do with them. Being familiar with the whole situation, it was assumed he would have the sense of security that accompanies such familiarity. In the situation the ability or knowledge which the subject had acquired was at a premium; it could scarcely fail to be recognized.

The subjects used in this section of the study were a group of fifteen children in the four-year-old group of the Iowa Child Welfare Research Station laboratories during the year 1932-1933. Their ages ranged from three years, eight months to four years, eight months. The mean age was four years, three months. The mean IQ[8] for the group was 128, the range from 100 to 160. The parents' statements concerning the home training of these children indicated that they had all been trained by methods quite superior to those used by the average parent.

Some preliminary observations in the group indicated a number of children who tended to stay somewhat in the background. These children were paired with other children in the group in the ascendance experiment which is described in Chapter II. The five children whose scores were lowest on five pairings in the ascendance experiment were adopted as the subjects for this experimental situation.

Three of the five subjects were children of local merchants, one was the son of a university professor, and one the daughter of a hospital technician. They are described in greater detail below:

---

8 All the IQ's given are obtained from Stanford-Binet tests given within a month of the time the initial ascendance scores were obtained.

Subject	Chronological Age		Intelligence Quotient
	Years	Months	
F593	4	8	135
M815	4	8	102
M816	4	4	146
M641	4	2	128
F822	3	9	133

F593 and M815 had played with other children considerably before starting to preschool. Both M816 and M641, on the other hand, had been quite exclusively confined to adult companionship outside of school. F822 had a sister a year older than herself with whom she played at home. Only M641 and F593 had had preschool experience previous to the year in which this study was carried on, M641 for two years and F593 for one year.

Ascendance scores were first obtained on each subject in ten pairings by the use of the ascendance experiment described in Chapter II. The training series which followed included three situations each involving only one type of play material—one a box of mosaic blocks, one a picture puzzle, and a third a picture book. Each subject was taken individually by the experimenter into the room, was made familiar with the situation and the materials, and taught to use them. The three situations are described in detail below.

Mosaic Situation

In the experimental room were a table and two chairs, with mosaic blocks and a cardboard frame in which to build a design placed on the table. The children were first taught to differentiate between the three shapes and the six colors represented in the blocks. The design of a cat made of similar blocks was then shown and the experimenter helped the subject select the colors and shapes in the design and put them together. The experimenter gave such assistance as was necessary to keep the child from becoming discouraged, but tried to see that each child learned to construct the design as rapidly as possible.

Picture Puzzle Situation

The subjects were shown the finished puzzle, a Tony Sarg picture of Old King Cole mounted on cardboard, and the location of the various outstanding parts of the picture were pointed out. With the child watching, the puzzle was taken apart and the child and the experimenter put it together. The practice was continued until

the child could put the picture together perfectly. The process was hastened by the experimenter repeatedly pointing out the cues by which certain pieces were placed.

Picture Book Situation

As the subject was brought into the room there was a small, green chair in the center of the room, always in the same position, and on it the picture book. The book was "Little Bim, the Circus Boy." It was selected for several reasons: It had large, very attractive pictures in colors. The story was interesting to children of this age and it could be followed easily by the succession of pictures. It involved, further, a great deal of both ideational and verbal repetition, which has been found to be especially attractive to children.

As the experimenter entered the room with the child she said, "The green chair facing the door is always yours, you know." As the child sat down the experimenter sat on the floor beside him. This was designed to give the child something of the attitude toward himself of the teacher in the story group who always sat on a low chair with the children on the floor around her. The story was read to the child once each day for several successive days, the hero being pointed out in the picture accompanying each part of the story. After the story was told three or four times, the child was urged to join with the experimenter in telling it if he did not do so voluntarily, especially in the parts involving repetition. Eventually he could tell it all.

As a precaution the experimenter went through the book twice with each subject pointing out what everything in each picture was, so that no child would be asked a question about the book which he was unable to answer.

The subjects were taken individually into each situation by the experimenter at least seven times, from ten to fifteen minutes at a time. If a child had not mastered the skill involved in the use of the materials by that time, the procedure was continued until he had. The subjects were familiarized with one situation at a time and taught the skill required in it. Then each subject was placed in that situation with another child from the group acting as a companion before the training procedure for the next situation began. Each child was paired with four companions in every situation; this made a total of twelve pairings for the three situations. The children with whom the subjects were paired in each training

situation were those who had previously acted as companions in securing the initial and final ascendance scores. Companions were so rotated that every subject was paired at least once with each of the ten children serving as companions. In the puzzle and the mosaic situations, the children were left ten minutes for each pairing. Almost that much time was usually required to finish the puzzle and the mosaic design. They remained in the picture book situation only five minutes for each pairing.

Records of the behavior of the subjects in the training situations were taken by the experimenter working behind a screen. The same records of behavior were taken in these situations as in the ascendance experiment. In order to secure a "training series score" on each subject which would be somewhat comparable to the ascendance scores, records of behavior were taken on the first five minutes of every pairing. The records of ten of the pairings, one with each companion, were used in computing the training series scores. These scores thus represented a total time of fifty minutes, an amount equal to that used in securing the ascendance scores. Final ascendance scores were obtained at the close of the training series, the interval between the initial and final ascendance experiments being ten weeks.

CHANGES IN ASCENDANCE SCORES

In Terms of Absolute Scores

The changes in the frequency of appearance of ascendant behavior in the subjects, as indicated by the difference between the initial and the final ascendance scores, is shown in the following tabulation:

Subjects	Initial Ascendance Scores	Final Ascendance Scores
F593	64	130
M815	37	40
M816	27	91
M641	40	72
F822	24	56

An increase in ascendance of considerable magnitude is evidenced by the scores of four of the five subjects. This change is presented graphically in Figure 2.

The initial ascendance scores were compared with the training series scores. The following tabulation shows that the differences

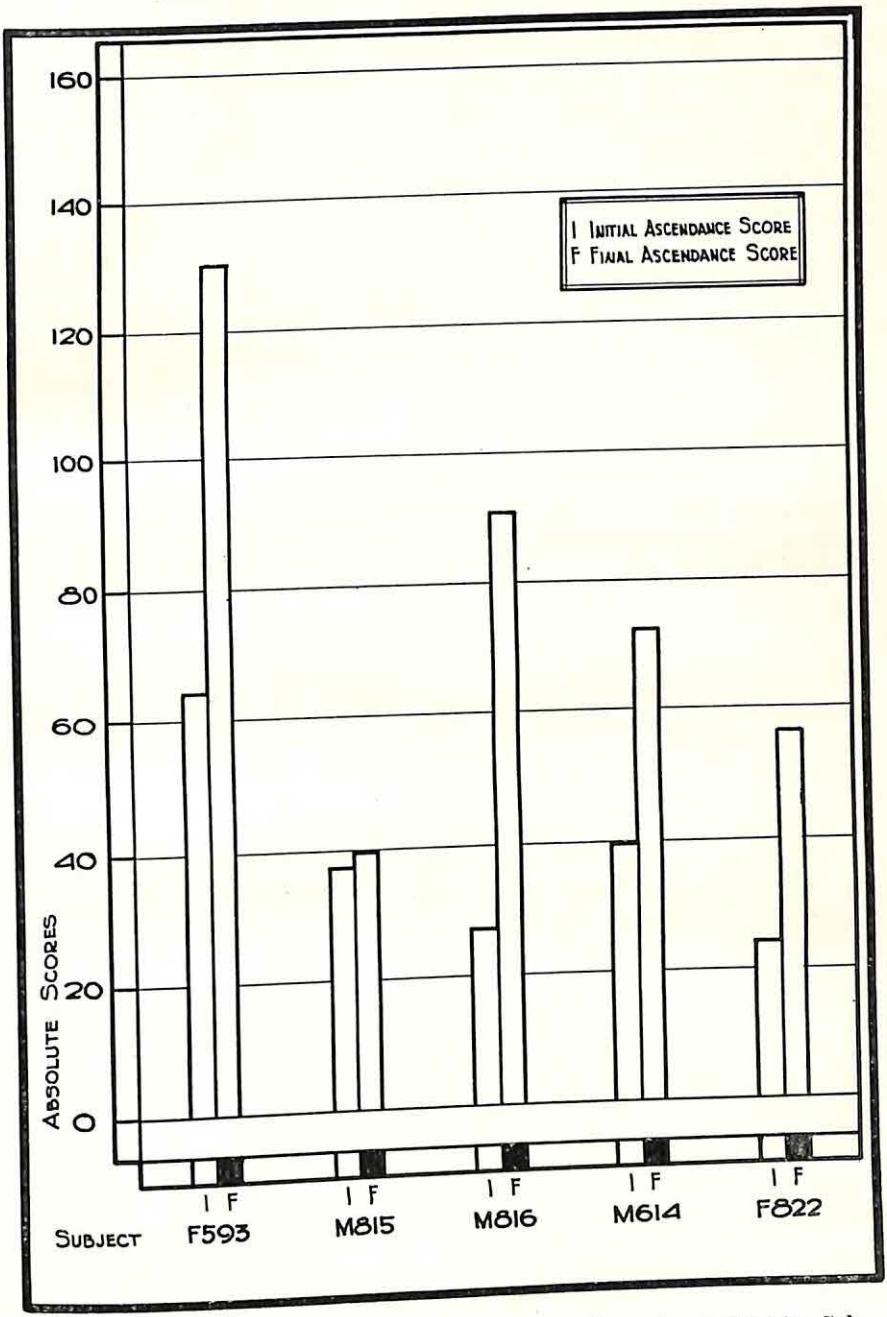


Figure 2. A Comparison of Initial and Final Ascendance Scores for Five Subjects in Terms of Absolute Scores

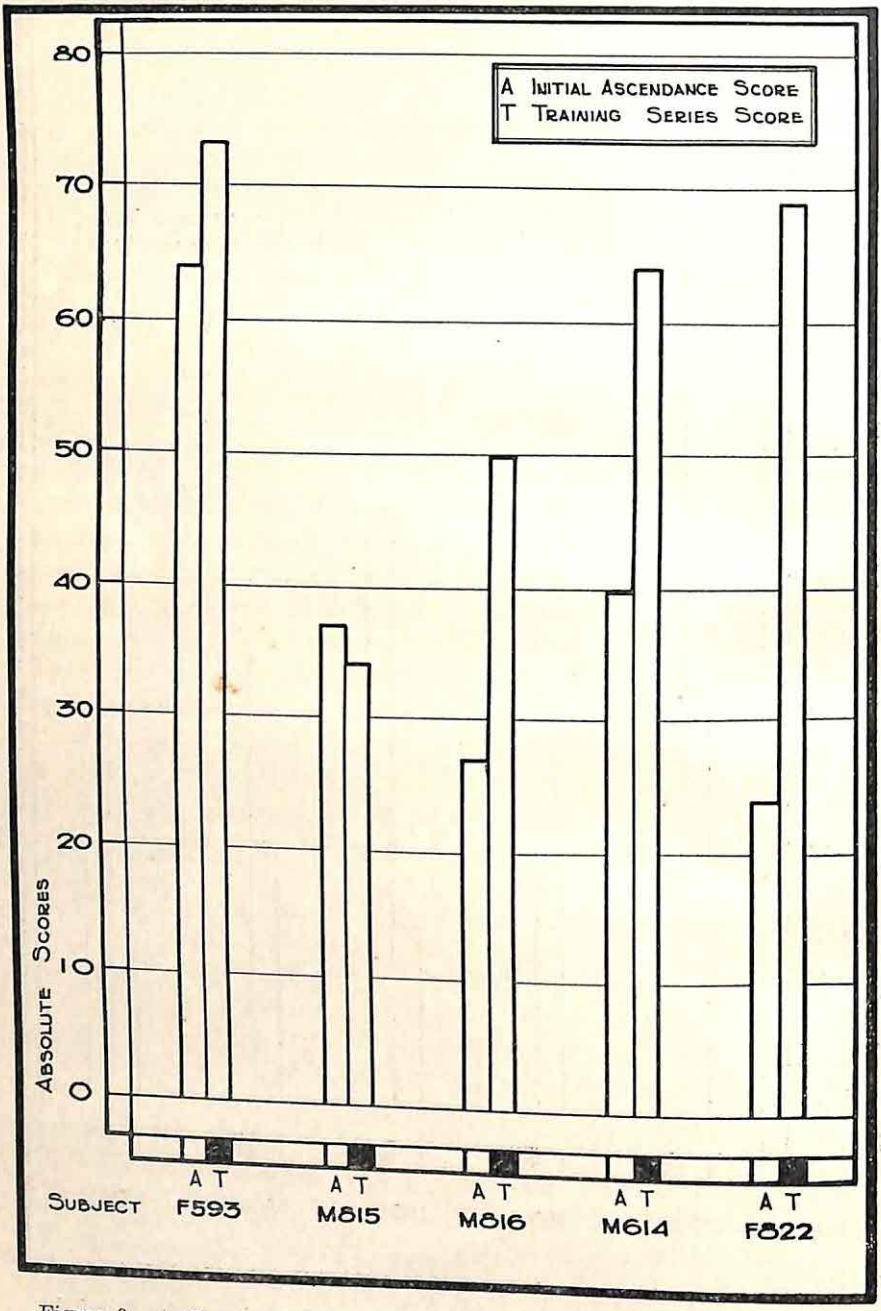


Figure 3. A Comparison of Initial Ascendance Scores and Training Series Scores for Five Subjects in Terms of Absolute Scores

in absolute terms between these two scores are not as great as those between the first and the final ascendance scores:

Subjects	Initial Ascendance Scores	Training Series Scores
F593	64	73
M815	37	34
M816	27	50
M641	40	64
F822	24	69

In this comparison, also, four of the five subjects showed an increase in ascendant behavior in the training series over the initial ascendance score. These data are presented in Figure 3.

In Relative Scores

It is questionable whether the scores in absolute terms or those in relative terms are the more significant. Changes in the absolute scores show the actual differences in the frequency of appearance of ascendant forms of behavior. The relative scores are expressed in per cents of the total number of ascendant patterns appearing in each situation. They show the frequency of the appearance of ascendant behavior on the part of the subject in relation to its frequency in his companion. It is true that a greater number of attempts to dominate by one child may result in eliciting more of such attempts from his companion in the form of counter suggestions and counter attempts. It is equally true that the effect may be quite the opposite.

In the situations of the training series, both children were engrossed much of the time in the correct manipulation of the materials. The frequency of the appearance of ascendant behavior on the part of the companions of the subjects was considerably less in these situations, therefore, than in the ascendance experiments. For this reason, the difference between the initial ascendance scores and the training series scores in terms of relative scores is much greater than the difference in absolute scores. The scores for the five subjects in both the initial and the final ascendance experiments and in the training series are presented in the following tabulation:

Subjects	Relative Scores in Percentages		
	Initial Ascendance	Final Ascendance	Training Series
F593	43	61	72
M815	26	39	48
M816	21	50	60
M641	35	40	46
F822	26	36	53

Considering the relative scores, we find that each subject showed an increase from his initial to his final ascendance score. Further, the training series scores in relative terms are greater in the case of every subject than either the initial or the final ascendance scores (Figure 4).

Qualitative Results

An analysis of the reactions of the subjects toward companions in the training situations showed two of them to have been particularly aware of the advantage of their position. These two, F593 and M816, constantly expressed surprise that their companions did not know how to use the materials and showed impatience and disgust at their mistakes. "Why can't you see that isn't a triangle? Don't you even know a triangle when you see one?" "No, you always have to use a white one turned over for a black or there won't be enough. Didn't you know that?" were remarks which appeared very frequently in their conversation.

The reactions of the subjects' companions may be classified into three types of patterns. Four of the companions were eager to learn and quick to take the initiative when they saw a chance. Two were frankly admiring and a little awed. Two children refused quite consistently to be directed; if they saw that they were not successful in using the materials, they would insist upon trying to make something else or to play a game of their own invention with the materials. Only one child was sullen and resentful.

One subject, M815, maintained a practically constant absolute score throughout each series. He had a pronounced speech difficulty which improved little in the course of the year. The situation involving the picture book was particularly inapplicable to his case. He did not say a word in any of the situations involving the book. In a number of the test situations he was mildly ridiculed by his companion for his inability to make himself understood. In two

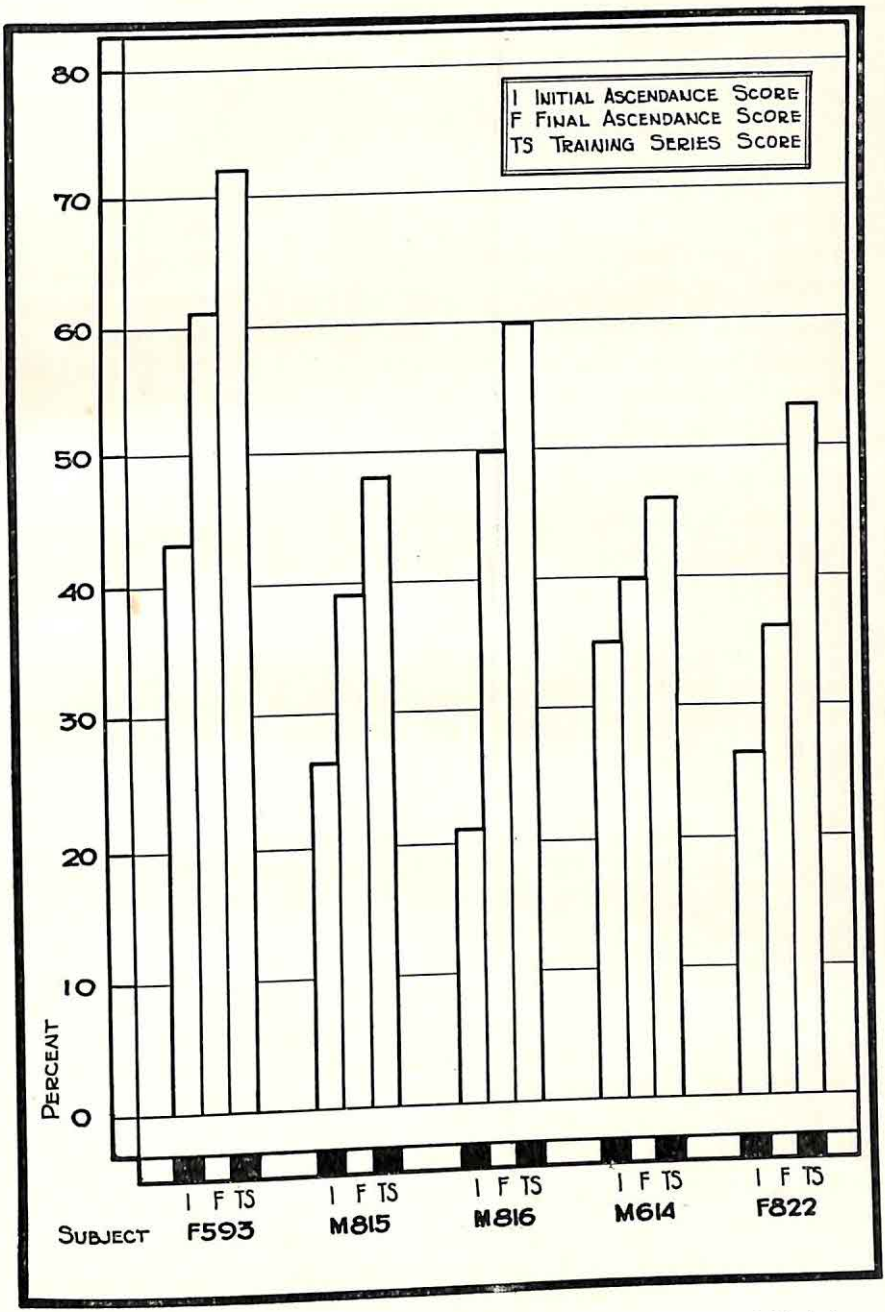


Figure 4. A Comparison of Initial and Final Ascendance Scores and Training Series Scores for Five Subjects in Terms of Relative Scores

situations his companion attempted to get him to pronounce something correctly. This subject, M815, spent much of his time with one other child in the group with whom he had played a great deal at home. She had no difficulty in understanding him and M815's behavior with her showed him to be decidedly less retiring than usual and to have a certain spontaneity that characterized him at no other time.

It is to be noted that in only one case did one of the nonascendant subjects achieve domination of more than half his contacts in the final ascendance experiment as indicated by the relative scores in that experiment. This one child, F593, had a relative score of 61 per cent on the final ascendance experiment, but started out with a relative initial ascendance score of 43 per cent.

COMPARATIVE CHANGES IN ASCENDANCE SCORES IN SUBJECTS AND PRESCHOOL GROUP AS A WHOLE

It has been suggested by Barker (4) that the number of social contacts made by preschool children increases with age. Berne (6) has found participation positively correlated with mental age in preschool children. Walsh (31) reports sociability to be increased by preschool experience. Her findings would lead us to suspect that the expressions of ascendance would increase in the group in the course of the year. Comparison of the initial and final mean ascendance scores for the total preschool group from which the subjects were selected did show an increase in mean scores over the interval between the two ascendance experiments. The difference between the means for the whole group, however, was not as great as that shown by the subjects. Mean ascendance scores for the entire preschool group, the subjects, and the whole group excluding the subjects were:

	Mean* Initial Ascendance Scores	Mean Final Ascendance Scores	Mean Difference
Experimental subjects	38.40	77.80	39.40
Total group	52.14	65.65	13.51
Total group, excluding experimental subjects	79.76	87.00	7.24

* The comparison in the tabulation and that indicated in Figure 4 uses the scores of the ten companions of the subjects in the pairings multiplied by two because they represent the total score on only five pairings for each experiment, while those of the subjects represent ten pairings.

The mean increase from initial to final ascendance scores in absolute terms is 13.51 points for the total group of fifteen children, 7.24 for the ten children who served as companions for the subjects, and 39.40 for the subjects themselves. The mean difference in the

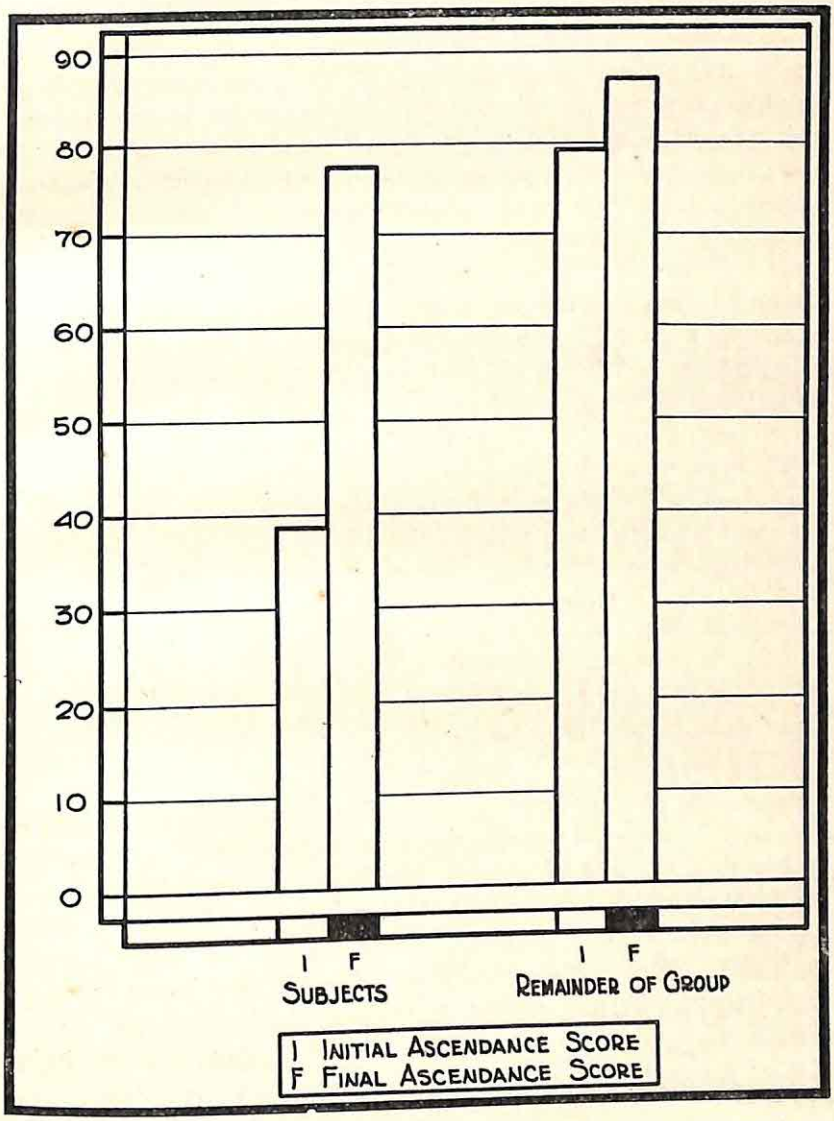


Figure 5. A Comparison of Initial and Final Ascendance Scores for Subjects and for Remainder of Their Preschool Group in Terms of Absolute Scores

scores of the subjects as compared with that shown by the remainder of the group is indicated in Figure 5.

COMPARATIVE CHANGES IN ASCENDANCE SCORES IN SUBJECTS AND CONTROL GROUP

To establish further the effectiveness of the procedure used in the study, it was thought desirable to compare scores on two ascendance experiments following one another at the proper interval, using as subjects a matched group of nonascendant children who were in the same preschool environment as the subjects of the main experiment. Such a group was not available. A group of eighteen children of the same age in the preschool group of the previous year were used as the nearest possible approach to an ideal control group. Scores had been secured on the ascendance experiment for these eighteen children and on a repetition of the experiment two months later.[9] The five children with the lowest scores on the first experiment were separated from the group and their scores compared with those of the five subjects of the main experiment.

The mean score for the whole preschool group of eighteen children from which the control group was selected remained almost constant over the two months' interval in this case. The mean ascendance score in the first experiment was 37.2 and in the second, 36.5, showing a mean decrease of .7 points. The five children at the bottom of the ascendance scale on the first series changed slightly more than the remainder of the group. They showed a gain in mean scores of one point, from 20.2 to 21.2. We may contrast this with the mean gain of 39.40 points made by the experimental group over an approximately equal period of time.

When the scores for each of the five nonascendant children in the control group are expressed in relative terms, that is, in relation to the total number of items of ascendant behavior appearing in each test situation, we see that three subjects in the control group have a lower relative standing in the second experiment than in the first, and two a higher standing. The changes in the group of experimental subjects, on the other hand, indicate an increase in relative scores in every case. The extent of these changes is indicated for each subject in the following tabulation:

[9] The interval between the two test series was eight weeks in the control group and almost ten in the experimental group.

Experimental Group		Control Group	
Initial Ascendance Scores	Final Ascendance Scores	Initial Ascendance Scores	Final Ascendance Scores
43	61	32	37
26	39	62	46
21	50	28	27
35	40	33	41
26	36	41	25

IDENTIFICATION OF TYPES OF ASCENDANT BEHAVIOR PATTERNS IN WHICH CHANGES OCCURRED

Finally, it is of interest to see in just what types of behavior the ascendance scores of the subjects show their greatest change. The scores were divided into points made by attempts to control and those made by success in controlling. A comparison of the ratio of success to attempts in the two experiments shows: 45 successes to 86 attempts in the initial ascendance experiment, and 85 successes to 224 attempts in the final ascendance experiment.

The proportion of successful attempts in the first case was 52.3 per cent; in the second experiment it was reduced to 37.9 per cent. The change, therefore, appeared in the number of attempts made by the children to carry out their purposes rather than in their success in doing so.

A second differentiation was made between the increases in scores made by the group in pursuit of their own interests in securing materials, and those made in directing the behavior of others.[10] These scores included both attempts and success in each type of behavior. The results of the differentiation were:

Behavior	Score	
	Initial Experiment	Final Experiment
Attempts and success in securing materials	58	98
Attempts and success in directing others	73	209

Scores made by directing others' behavior formed 56 per cent of the total of the two types of scores on the first series; on the second, they formed a greater proportion of the whole, 67 per cent.

[10] The directing scores that were counted included only positive direction and compliance of the companion. Forbidding and providing a pattern for imitation were not included.

The increase in the subjects' scores was greater in points made in directing the activities of their companions than in securing materials for their own purposes.

SUGGESTED ANALYSIS OF LEARNING IN A SOCIAL SITUATION

Regardless of varied theories concerning the manner in which learning takes place, we may assume agreement on the significance of learning itself in social as in other types of behavior. Interaction among persons results in learning which directly or indirectly affects future behavior. Kimball Young (34) offers a helpful differentiation between direct and indirect effects of experience upon behavior in his classification of consummatory and anticipatory habit systems. Through the anticipatory habit systems, experience acquires meaning, selective tendencies arise, and attitudes come into existence, giving objects a positive or a negative value for each individual. Through the consummatory systems, overt habits are acquired.

We may differentiate three distinct variables among the social factors operating to determine the degree of ascendance which a child shows. In the field of anticipatory behavior we distinguish two, the child's status in his group and the value he places upon the ability to dominate others. The child's accommodation, or the process by which his status is fixed, is commonly conceived by social psychologists and sociologists as being determined in part by his conception of his rôle in the group. We may assume his behavior to be in response to a whole galaxy of attitudes and ideas, important among them the attitudes of other persons toward him as they appear in his own imagination. His attitude toward himself is also a factor, that attitude being a result of the attitudes of his group modified, perhaps, by his actual knowledge of his own abilities and his past accomplishments. At any rate, experience does affect him in this indirect manner by determining the status that he acquires in his group.

The second of these factors, which varies with the first but probably in no constant ratio, is the value that the individual attaches to dominating others and the strength of his urge to control or supersede others. It seems that a given child may have a superior status in his group, but not exercise the prerogatives of his position merely because controlling the behavior of others is not a great

source of satisfaction to him. There is very real evidence in the behavior of children that great variations exist in this particular value as it operates in a play situation. Even if we take it for granted, as do Park and Burgess (22), that the desire for recognition, expressed in part in ascendant behavior, is a permanent and universal trait of human nature, we have made no assumptions about how greatly the tendency varies in individuals. In whatever degree it may originally exist, the strength of that value may vary with the experience of the child, for achievements reveal the satisfactions in which they result and these satisfactions tend to become indispensable only when they have been a part of experience. The purpose emerges out of the process itself.

Complementary to this second variable in the field of anticipatory behavior is a third appearing in the field of consummatory or overt behavior. The value which a child attaches to his ability to control and direct his companions may vary; his skill in controlling them may vary as well. His ability may be the result of many factors; practice looms large among them. Here we find the direct effect of previous experience in determining behavior through the formation of overt habits.

All three of these variables have a reciprocal relation. The child's success in controlling his companions is probably dependent in part upon the amount of practice he receives; the amount of practice varies with the frequency of his attempts to direct; and the frequency of these attempts varies with the value he places upon directing others, and probably in part upon the position he feels he has attained in the group.

We may add a note as to the specificity or generality of the changes in behavior that the investigation has shown. The tendency, as illustrated by the studies of Hartshorne and May (14), has been to emphasize the variations of behavior from one situation to another and to interpret these variations as indicating that behavior is specific in each situation. In this study there appears some carry-over, perhaps of the attitudes developed in the training situations, to another and somewhat different situation.

SUMMARY AND RESULTS

Five children found to have low ascendance scores were familiarized with certain situations and supplied with such knowledge and skill as the situations required. They were then placed in those

situations with other members of their preschool group, to whom the situations were entirely new. Scores comparable to those in the ascendance series were obtained on the subjects during the time they were in the series of training situations. Following this, ascendance scores were again obtained.

A comparison indicated a mean increase from the initial to the final ascendance scores and from the initial ascendance scores to the training series scores, although practically no change was evidenced in the absolute scores of one of the five subjects. Final relative scores were greater than the initial scores, however, in the case of every subject. The training series scores, in relative terms, were greater in the case of every subject than either the initial or the final ascendance scores.

The five subjects showed a greater increase in ascendance scores than did the remainder of the same preschool group over the same period of time. Their increase was decidedly greater than that evidenced in a control group of nonascendant children of the same age.

A greater increase in scores was noted in attempts made to dominate than in the success of those attempts. A greater increase occurred in directing the behavior of others than in maintaining rights to property.

CHAPTER V

SUMMARY AND RESULTS

Ascendant behavior, defined to include (1) the pursuit of one's own purposes against interference and (2) directing the behavior of others, was studied in a group of four-year-old children in the preschools of the Iowa Child Welfare Research Station.

An ascendance experiment made up of a series of ten five-minute pairings with ten other children acting as companions was devised. The materials used in the situation included a small sand-box containing toys that had been found to be conducive to interaction and coöperative play.

Records of behavior were taken on each subject during the experimental situation. His attempts to secure materials or position in line with his own interests, to direct the behavior of others, his success in both types of attempts, and the provision of a pattern for imitation were noted; his "ascendance score" was computed from them. The scores were secured with a reliability indicated by a per cent of agreement of .96 ± .03 with a second observer. The series of pairings yielded a self-correlation of .80 (after the application of the Spearman-Brown prophecy formula) and correlated with a composite of three teachers' ratings .81 ± .01 (rank difference).

An experimental group of eighteen four-year-old children in the preschool in 1931-1932 was divided into thirds on the basis of these scores and called the ascendant, moderately ascendant, and nonascendant groups. The mean score difference between the ascendant and the nonascendant groups proved to be 50.66, the standard error of that difference, 6.29.

An attempt was made to see what factors in social behavior could be found that would differentiate successfully between the two groups. Certain factors in general social behavior were studied.

Social responsiveness was reliably sampled by a series of observations in the play group in the preschool. It proved to be a constant concomitant of ascendance in this group but was not always accompanied by ascendant behavior. The correlation between the two was .65 ± .07.

Expansive behavior in a supervised group, measured by observation in the group, did not show a close relationship to ascendant behavior. The children who were least amenable to adult control,

as determined by an experimental situation, were among those with the high ascendance scores, but the correlation between the two characteristics was only .56 ± .12.

Evidences of a competitive attitude, as measured by observation in a controlled situation, were found to be twice as frequent in the behavior of ascendant as in the nonascendant group. Claims for attention, measured in the same manner, were found to be equally characteristic of the two groups.

Direct techniques used in the control of the behavior of others were studied by the analysis of records of observation. The record of an hour's play in which the child was engaged in activity that showed distinct social participation was obtained on each child in the group of eighteen. The techniques used by the ascendant and nonascendant groups were studied comparatively. The analysis included: the type of suggestions the child used, whether they were commands, suggestions beginning with "Let's," questions, or statements; the accompanying attempts at verbal persuasion, including bargains, reproof, repetition, reasons, and threats; and the accompanying use of force.

The ascendant children attempted to control the behavior of their companions two to three times as frequently as the other group, even when the amounts of time in social participation were equated. When the proportion:

$$\frac{\text{Number of times a given technique}}{\text{Total number of attempts at control}}$$

was considered few differences between groups were found. The proportionate use of force was almost equal for the two groups.

Observation records of socially participative activity were also taken on another group of twenty four-year-old children of the summer enrollment in the preschool in an attempt to discover some of the types of cues that determine the initial interaction that takes place among children. The outstanding difference between the ascendant and nonascendant children, shown by the analysis of behavior records, appeared in the expressions of the presence and lack of self-confidence evidenced by the children in the two groups. An attempt was made, therefore, to create a situation in which nonascendant children might be given a degree of confidence in themselves by experiences of a certain type, and to determine the effects of this procedure.

Five nonascendant subjects, determined by ascendance scores,

were selected from the four-year-old children in the preschool group for 1932-1933. The experimenter took each subject individually and made him thoroughly familiar with three training situations, each involving different types of materials. In each case he was taught the knowledge and skill that the materials required. The subjects were then placed in these training situations with children who had acted as companions in the ascendance experiment, and scores were secured in this series for an amount of time equal to that of the ascendance experiment. These were called the training series scores. Final ascendance scores were secured following this.

Initial ascendance scores were compared with the training series scores and final ascendance scores. Results of these comparisons are:

1. Four of the five subjects had higher training series scores than initial ascendance scores, in absolute terms.
2. Four of the five subjects had final ascendance scores markedly greater than their initial scores, in absolute terms.
3. All of the five subjects showed a decided increase, in relative terms, from the initial to the final ascendance scores. In relative terms, every subject had a training series score greater than either his initial or final ascendance score.
4. The five experimental subjects showed a greater increase in mean ascendance scores than the remainder of the same preschool group over the same period of time.
5. A control group composed of five nonascendant children of the same age as the subjects but in another preschool group showed an increase of one point in mean ascendance scores over a period of time almost equal to that between the two ascendance experiments in the experimental group. The experimental group showed a mean increase of 39.40 points.
6. The experimental group showed an increase in the standings of each of the five subjects relative to their companions in the experiments, in terms of relative scores. In the control group three subjects lowered and two raised their positions in the group.
7. Greater increase in ascendant behavior was noted in the number of attempts made by the subjects to pursue their own interests and to direct others than in their success in doing so. A greater increase occurred in the scores made by the children in directing the behavior of others than in those made in the pursuit of their own interests against interference.

REFERENCES

1. Adelberg, Von Hilde: Führertum im Kindergarten. Zsch. f. pad. Psychol., 1930, 31, 144-156; 200-203.
2. Allport, Floyd Henry: Social psychology. Boston: Houghton Mifflin, [c. 1924] Pp. xiv, 453.
3. Allport, Gordon W.: A test for ascendance-submission. J. Abnorm. & Soc. Psychol., 1928-1929, 23, 118-136.
4. Barker, Margaret: A technique for studying the social-material activities of young children. Teach. Coll., Columbia Univ., Child Develop. Monog., 1930, No. 3, Pp. 69.
5. Bender, Irving Edison: Ascendance-submission in relation to certain other factors in personality. J. Abnorm. & Soc. Psychol., 1928-1929, 23, 137-143.
6. Berne, Esther Van Cleave: An experimental investigation of social behavior patterns in young children. Univ. Iowa Stud., Stud. in Child Welfare, 1930, 4, No. 3, Pp. 93.
7. Bonham, M. A., and Sargent, M. K.: A study of the development of personal traits in children twenty-four and thirty months of age. Master's Essay, Catholic University of America, 1928. (Cited by Murphy and Murphy (21).)
8. Brown, S. Clement: Some case studies of delinquent girls described as leaders. Brit. J. Educ. Psychol., 1931, 1, 162-179.
9. Caldwell, Otis W., and Wellman, Beth: Characteristics of school leaders. J. Educ. Res., 1926, 14, 1-13.
10. Cushing, Hazel Morton: A perseverative tendency in pre-school children: A study in personality differences. Arch. Psychol., 1929, 17, No. 108, Pp. 55.
11. Dashiell, John Frederick: Fundamentals of objective psychology. Boston: Houghton Mifflin, 1928. Pp. xviii, 588.
12. Folsom, Joseph K.: Social psychology. New York: Harper, 1931. Pp. xviii, 701.
13. Goodenough, Florence L.: Inter-relationships in the behavior of young children. Child Develop., 1930, 1, 29-47.
14. Hartshorne, Hugh, and May, Mark A.: Studies in the nature of character: I. Studies in deceit. Teach. Coll., Columbia Univ., Character Education Inquiry in coöperation with the Institute of Social and Religious Research. New York: Macmillan, 1928. Pp. xxi, 414.
15. Holzinger, Karl J.: Statistical methods for students in education. New York: Ginn, 1928. Pp. viii, 372.
16. Krueger, E. T., and Reckless, Walter C.: Social psychology. New York: Longmans, Green, 1931. Pp. vii, 578.
17. Leib, Arthur: Vorstellungen und Urteile von Schülern über Führer in der Schulklasse. Zsch. f. angew. Psychol., 1928, 30, 241-346.

18. Marston, Leslie R.: The emotions of young children: An experimental study in introversion and extroversion. Univ. Iowa Stud., Stud. in Child Welfare, 1925, 3, No. 3, Pp. 99.
19. Moore, Elizabeth S.: The development of mental hygiene in a group of young children: An analysis of factors in purposeful activity. Univ. Iowa Stud., Stud. in Child Welfare, 1931, 4, No. 6, Pp. 128.
20. Murchison, Carl [editor]: A handbook of child psychology. Worcester, Mass.: Clark University Press, 1931. Pp. xii, 711.
21. Murphy, Gardner, and Murphy, Lois Barclay: Experimental social psychology. New York: Harper, 1931. Pp. 709.
22. Park, Robert E., and Burgess, Ernest W.: Introduction to the science of sociology. 2nd ed. Chicago: Univ. Chicago Press, [c. 1924] Pp. xxiii, 1040.
23. Parten, Mildred B.: Social participation among preschool children. J. Abnorm. & Soc. Psychol., 1932-1933, 27, 243-269.
24. Parten, Mildred B.: Leadership among preschool children. J. Abnorm. & Soc. Psychol., 1932-1933, 27, 430-440.
25. Parten, Mildred B.: Social play among preschool children. J. Abnorm. & Soc. Psychol., 1933-1934, 28, 136-147.
26. Thomas, Dorothy Swaine, and associates: Some new techniques for studying social behavior. Teach. Coll., Columbia Univ., Child Develop. Monog., 1929, No. 1, Pp. x, 203.
27. Thomas, William I., and Thomas, Dorothy Swaine: The child in America: Behavior problems and programs. New York: Knopf, 1928. Pp. xiv, 583, xviii.
28. Thomas, William I., and Znaniecki, Florian: The Polish peasant in Europe and America. Vol. II. New York: Knopf, 1927. Pp. vi, 1117-2250.
29. Thurstone, L. L.: Multiple factor analysis. Abstract in Program of the Thirty-Eighth Annual Meeting of the American Psychological Association, held at Iowa City, Iowa, December 29, 30, 31, 1930, Pp. 72. (p. 27)
30. Van Waters, Miriam: The child who is a leader. Survey, 1927, 58, 498-505.
31. Walsh, Mary Elizabeth: The relation of nursery school training to the development of certain personality traits. Child Develop., 1931, 2, 72-73.
32. Woolley, Helen T.: Agnes: A dominant personality in the making. Ped. Sem., 1925, 32, 569-598.
33. Work of child development research centers: A survey. Child Study, 1929-1930, 7, 292-302.
34. Young, Kimball: Social psychology: An analysis of social behavior. New York: Knopf, 1930. Pp. xvii, 674, xxi.

PART TWO

A STUDY OF THE DEVELOPMENT OF TWO- AND THREE-YEAR-OLD CHILDREN WITH RESPECT TO PLAY ACTIVITIES

by

ELIZABETH MOORE MANWELL
and
IDA GAARDER MENGERT

A STUDY OF THE DEVELOPMENT OF TWO- AND THREE-YEAR-OLD CHILDREN WITH RESPECT TO PLAY ACTIVITIES

PROBLEM

This study of the development of two- and three-year-old children with respect to play activities and to mental hygiene values was carried on through systematic observation. Two major groups of problems were met: (1) the problems of method and (2) the problems of children's development.

The problems of method include the following questions:

1. How accurately can the behavior of young children, with respect to play activities and to mental hygiene values, be observed in numerical terms?
2. Can more than one aspect of behavior in a child be observed accurately at one time?
3. How long a period of time is necessary to give adequate samples of behavior? Does the minimum length of observation vary for various aspects of behavior?
4. How do scores based upon direct observation compare with ratings by teachers? Does the amount of agreement depend upon the kind of behavior considered?

HISTORICAL BACKGROUND

The observational method of gathering data from the study of behavior of preschool children has been used to an increasing extent in the years since the opening of the first nursery schools in this country. The earliest form was the diary record in which the observer, by means of running notes, described the child's behavior as he saw it. Because of the difficulty of handling such a mass of data, attempts were soon made to evolve systems by means of which behavior could be recorded and partially tabulated at the same time, running notes then being used only in a supplementary way. Observers soon became interested in the question of reliability of these observations. They wanted to know whether two persons would record behavior in the same way. Thomas (8), Barker (2), and others attempted to define carefully the terms

used in their record forms, and then to apply statistical measures to the data gathered by several observers to answer this question. They found that observers with some experience could be trained to interpret certain behavior activities in terms of definitions previously given with a fairly high degree of agreement. They found further that agreement was higher for the occurrence of behavior than its function and for specific overt activity than its placement in categories. The question of time sampling has also received consideration in recent studies. Moore (7) made a continuous hour's observation on each of several children in an attempt to study total behavior. Berne (4) observed six children continuously, but in rotation. Goodenough (5) reported observations made on a five minute and again on a one minute sampling, while Barker (1) described the results of five minute observations. In the case of both Goodenough and Barker the correlations between observers indicated a fair amount of agreement for all traits, and high agreement for some. The question of adequacy of the sample has not, however, been satisfactorily answered. A further control has been put upon the use of the observational method in the nursery school situation by limiting the field for study. Thus Hulson (6) studied the choice of play activities of a small group of children during the free play period, Barker (2) studied activity and social contacts, and Moore (7) recorded teacher-child contacts.

Beaver (3) found that she could record reliably in repeated five-minute observation periods the initiation of social contacts by preschool children, but that her technique was more reliable for obtaining the total number of contacts than for differentiating the contacts by type. Arrington (1) also tested the adequacy of the five-minute observation period, using a technique for recording those spontaneous activities of young children which are concerned differentially with persons, with things, and with the self. She stated, "The reliability of observers . . ., based on five-minute and one-minute samples of activity was extremely high," and that "Results of the study indicate that a minimum of twenty-four five-minute records of activity is needed to obtain an adequate sampling of the behavior of individual children. For certain types of activity, notably physical contacts, laughing, and crying, a longer period of observation is to be desired."

The modifications of the diary record method of study, as briefly outlined here, placed the observational method for collecting data

on a somewhat firmer footing. As a result of studies done on this basis, much light is being thrown on the possibilities of the method for use in the study of certain subjects not yet well enough known to lend themselves to a more controlled approach. It is one of the purposes of this investigation to extend this information further, to make additional contributions to the knowledge of what items can be observed accurately and the length of time required for them. On the side of content in the present study, interest is largely centered on age differences and growth in play activities and social relationships.

SUBJECTS AND THEIR BACKGROUND

The subjects of this study are thirty-five children ranging in age at the beginning of the observation from twenty-one months to forty-four months. These children were enrolled in the preschool laboratories of the Iowa Child Welfare Research Station at the State University of Iowa at Iowa City. Fifteen of the children were enrolled in Preschool Group I, which was in session from nine until half past eleven o'clock in the morning; the remaining twenty were at the Preschool Home Laboratory, which was in session from nine until four o'clock. Both groups were in preschool for five days a week.

The children in these groups are all American-born and their parents almost without exception were also born in America, a large majority having been born in the middle-west section of the country. The occupational status of the parents is above average, having a mean of 15.21 with a standard deviation of 2.45 when classified according to the Barr rating scale.[1] The average for the population at large is stated to be 7.92 ± 3.38.

The economic status of the homes is, in general, not as high relatively as the occupational status, for many of the parents were engaged temporarily in graduate study, or were only at the beginning of their careers. In few of the homes servants were employed. The children lived in a small university city, most of their homes being in small detached houses; about two-thirds of the group had a yard for outdoor play.

The educational program of both preschools where the study was

---

1 Terman, Lewis M., Baldwin, Bird T., Bronson, Edith, and Others: Genetic Studies of Genius. Vol. I, Mental and Physical Traits of a Thousand Gifted Children. Stanford, Calif.: Stanford University Press, 1925. Pp. xv, 363. (p. 70)

carried on was simple and flexible. Much time was spent in informal outdoor play, with apparatus and equipment arranged to encourage physical, creative, and social development. While the initiative of the individual child was fostered, the teachers gave occasional guidance and suggestion. Definite attention was directed by the teachers to aid the children to develop as individuals and as members of a group. There was considerable coöperation between home and school.

PROCEDURE

In each of the preschool groups an observer followed each child in turn for twenty minutes, getting around the group about once each week. Five such observation periods, making 100 minutes, constituted a series. Each series generally included an observation covering a different part of the school morning, from nine until eleven o'clock. Five series were obtained for each child throughout the school year, making a total of six to eight hours for each child in each group, except in cases of long continued illness. In general, the first, third, and fifth series centered around the months of October, 1929, January, 1930, and April, 1930, respectively.

The observation blank used with the developmental record, a copy of which may be seen in Figure 1, gave opportunity for checking twenty-seven items of behavior at one-minute intervals, in either their positive or negative aspects. Only one positive (+) or negative (—) sign was checked for any item in any one minute, so that a maximum score of twenty checks for any aspect of behavior was allowed in each observation period. Running notes were also made of the child's behavior during each minute.

Beginning with the fourth series the observers not only scored the children by tabulations made at the time of the behavior, but after the period was over they rated each child without reference to their tabulations (on a five point scale) to give their total impression of the various aspects of his behavior.

The definitions, in their final revision, with instructions for observing, tabulating, and rating, are given below:

Description of Behavior Items

1. Language Frequency

Included each instance of the spontaneous verbal expression of an idea in a sentence or phrase. Continuous repetitions of exactly the same words are counted only once. Interjections and "yes" and "no" are not counted.

2. Physical Activity

Included each instance of play with mobile toys and large apparatus, such as the following: Climbing into, pulling, carrying, or swinging on ladders; climbing into or moving portable boxes; riding kiddy kar or tricycle; pulling or pushing train, wagons, truck, or other locomotive toys; sitting on seesaw; climbing, swinging, running, or walking on slide; throwing or catching ball or touching it when it has been thrown; climbing, swinging, or pulling on balcony or jungle gym; climbing into, jumping upon, or sliding from large packing boxes; pushing garden seat by leg or arm; using garden tools for gardening or digging; pushing swing for another child; sitting or standing in rope swing; standing or pushing in moving lawn swing; pulling or swinging on trapeze or rings; pulling or jumping on stationary bars; playing running or walking game; jumping from, or walking on runway or edge of pool or curbing; splashing or swimming in pool; digging in sand with large implement.

3. Creative or Constructive Activity

Each instance of making something by rearrangement of materials such as: Molding clay; marking with crayon, paintbrush, or pencil; putting blocks together; constructing with sand some shape which is a projection of an idea as obvious as garage, pie, cake, track, etc.

4. Manipulative Activity

Instances such as the following were included here: Making series of movements which give tactual sensation; turning a block in the hand, feeling corners; lifting sand through fingers; making exploratory movements which acquaint him with properties. (No finished product results from such play. The activity gives immediate rather than deferred satisfaction.)

5. Dramatic Activity

Included each instance of a series of activities expressing imagination, i.e., attributing qualities to the material which are not intrinsic in the material, such as the following: Playing with doll; sweeping the floor; washing or ironing clothes; using mobile toys in game of trucking; playing doctor, bear; playing house; playing hiding game.

6. Interest in Stories

Includes such instances as: Asking for stories; picking up book or coming to book and looking at it; joining story group and giving attention to story by looking at speaker, responding to story by facial expression; responding to story by bodily movements, or imitative acts, by asking for another, or by helping in the telling of the story; telling story to self or to others.

The negative aspect includes: Making an irrelevant disturbing commotion while in the story group; leaving story group when distracted, while story is in progress.

7. Interest in Pictures

Includes such instances as: Asking for pictures; picking up or coming to picture book and looking at it; joining picture group and giving attention to pictures by looking at the speaker, responding to pictures by facial expression; responding to pictures by bodily movements, imitative acts, by asking to see another, or by helping in showing the pictures; showing pictures to self or to others.

The negative aspect includes: Making an irrelevant disturbing commotion while in the picture group; leaving picture group when distracted, while picture is being shown.

8. Interest in Music

Includes such instances as: Asking for music; picking up or coming to music book and looking at it; joining music group and giving attention to music by looking at the singer, responding to music by facial expression; responding to music by bodily movements, imitative acts, by asking for another song, or by helping in singing the song; singing song to self or to others.

The negative aspect includes: Making an irrelevant disturbing commotion while in the music group; leaving music group when distracted, while singing is in progress.

9. Self-Responsibility

Incidents such as getting materials for his play and in so doing having to take some intermediate steps before he is ready to use his material are included under self-responsibility. This item refers to play activities and not to routines for personal health. Example: Getting a table ready with oilcloth on it and then getting out clay, or asking for something out of sight or reach.

The negative aspect includes: Asking teacher or another child to get him a toy he cannot reach; stating inability; asking for help by voice or pulling.

10. Attitudes in Routines

This item refers to the child's singleness of purpose and carrying through a necessary undertaking. Check the minute when routines begin and the minute when they end. Draw a line between checks. Do not check positive or negative.

11. Attention

Enclose in a circle all marks indicating activities which were prolonged for a minute. Check this under all other items but not under attention as such.

12. Leadership

Such instances as suggesting verbally to one or more children that they follow his activity or organizing a game involving himself and one or more others are included under leadership. Example: Leads another child in marching in a "band."

The negative aspect includes: Copying other children in definite series of action, noises, or words.

13. Group Play

Such activities as participating in group play, showing by overt, expressive behavior that he is affected by the group are included here: Tumbling, running, jumping, or laughing with another child, repeating the action more than once; waiting at the bottom of the slide for others, talking or laughing with them; racing with others in house play; including others in house play; constructing with others, discussing project, or handling of materials; playing games such as, "Ring Around a Rosey."

The negative aspect includes: Playing alone, physically apart from other children. If space or material does not permit him to play at any distance, nevertheless, by his lack of overt social reactions, it is clear that his play is independent of those about him.

14. Independence of Group

Includes such incidents as playing contentedly alone, either before arrival of others or after the group has left the spot.

The negative aspect includes: Leaving occupation and running or walking back to group when the interest of other children has waned.

15. Watching Others at Play

Such incidents as looking at one or more children at play, and in so doing making some facial or bodily reaction which shows he is perceiving the other, although he does not participate; or staying physically near one or more children while space and material are such that he could, if he preferred, carry on the same activity elsewhere.

16. Independence of Adult

This refers to routines such as: Getting own wraps without reminder or suggestion; making attempt to put on wraps without asking for help; washing hands without suggestion or assistance.

The negative aspects of this type of instance include: Sitting beside adult; holding hand; asking adult to stay with him; following adult about; waiting for adult to help with wraps; etc.

17. Kindness or Sympathy

Includes: Exerting effort with apparent forethought to make another child happier; voluntarily speaking well of another person in his presence; seeing child cry or standing idle, and bringing him a toy; showing concern and making inquiry concerning another child's injury; showing affection, patting, hugging, kissing another child.

The negative aspect includes: Hitting, pushing, or biting another child for no apparent reason; and saying, "I don't like," or making similar statements for no apparent reason.

18. Conformity

This refers to his immediate behavior following an adult's request, such as: Taking adult's hand willingly, or running on alone, when asked to get orange juice, coming to the toilet, etc.; conforming pleasantly when adult makes suggestion as to occupation, or as to manner of making approach with a child.

The negative aspect: Refusing to obey; crying, kicking, screaming to show unwillingness; or having to be compelled.

19. Fair Play Regarding Common Property

Includes: Asking pleasantly for toys in use; and giving up toys when asked by child.

The negative aspect includes: Seizing upon toys already in use; refusing to share toys; sharing only after adult interference; whining, crying for toys.

20. Understanding of Common Property

Includes the child's apparent understanding that the toys are school toys and that all the children play with them; understanding his own rights to keep a toy he is using. (Rated but not checked)

The negative aspect includes: Looking bewildered when common property rights are explained to him by adult.

21. Assuming Responsibility

a. For Others

Includes the child changing his direction of force to avoid bumping or striking other children when playing, i.e., steers wagon around them.

The negative includes: Banging into children, thrusting them out of his path.

b. For Toys

Includes: Voluntarily picking up toys which he or another child has dropped; steering vehicle around toys lying on floor; putting books away without suggestion.

The negative includes: Banging into furniture; throwing other toys as he would a ball; stepping on toys instead of moving them or going around them; dropping books and toys on floor and ignoring them.

22. Laughing

Includes each instance of laughing, except playing at laughing, and instability.

23. Stability

Give positive mark every minute in which negatives do not occur.

The negatives are: Crying, squealing, or laughing excitedly and unrestrainedly when crossed, or when faced with a new situation, or when attempting a difficult feat.

24. Self-Assertion

Such items as: Crowding, pushing, clearing a path for himself; defending self against aggression.

The negative includes: Allowing himself to be pushed aside without self-defense; hanging back.

25. Mood

Such items are included as: looking cheerful and optimistic; singing to self; smiling. (Rated but not checked)

The negative includes: Looking gloomy or apprehensive.

26. Ability to Face a Situation

Includes: Attempting to see through a given situation, with or without help, and to face facts even if they are unpleasant.

The negative aspect includes: Blaming others, refusing to face the facts, even when explanations are given by the teacher.

27. Crying

Accompanied by tears.

ANALYSIS OF THE RESULTS

Problem of Method

Agreement Between Observers.—The agreement of either of the two main observers with any student whose work was used in part during the first three series was obtained by comparing results of scores on all items on single observations by the per cent of agreement. In general, when it was found that a given student agreed

poorly with *B* or *W* the training was extended before the student's work was accepted.

However, as the material of the study was largely based on the observations of *B* and *W* alone, more extensive work was done on analyzing the points of agreement and disagreement of these two observers. First, distributions of the scores on Series IV on each item of one observer were put into graphic form. It was found that the scores on the following items were sufficiently normally distributed to warrant the use of the Pearson product-moment formula to get correlations of the scores of one observer with another:

Language Frequency
Physical Activity
Group Play (+)
Group Play (—)
Watching Others at Play
Stability (—)

Table 1 gives the coefficients of correlation of the scores on these items of the two main observers of the behavior of thirty individual children during thirty twenty-minute observation periods. These scores were compared for their agreement during the first ten minutes, the last ten minutes, and the entire twenty minutes. As may be seen in this table, agreements during the first ten minutes and during the whole period on language frequency, physical activity, positive and negative group play yielded coefficients of correlation ranging from .951 ± .012 to .985 ± .004. Watching others

Table 1

Frequencies and Coefficients of Correlation of Scores of the Two Main Observers of the Behavior of Thirty Children During a Twenty-Minute Observation Period in Series IV

Behavior Items	Frequencies		Observation Period					
	Observers		First Half		Last Half		Both Halves	
	W	B	r	P.E.	r	P.E.	r	P.E.
Language frequency	371	344	.959	± .010	.910	± .021	.960	± .010
Physical activity	236	238	.985	± .004	.901	± .022	.972	± .007
Group play (+)	337	346	.972	± .007	.880	± .028	.957	± .010
Group play (—)	286	259	.965	± .009	.892	± .025	.951	± .012
Watching others (+)	119	110	.773	± .050	.541	± .087	.731	± .057
Stability (—)	26	18	.502	± .092	.845	± .035	.682	± .067

and negative stability yielded on the entire periods coefficients of .731 ± .057 and .682 ± .067.

It may also be seen that with the exception of the last item there was a higher agreement during the first ten minutes than during the last, making the coefficients for the first half higher than or as high as the coefficients for the period as a whole. In order to see whether this phenomenon was peculiar to the agreement of these two observers, the observations of each of the two were compared with every other observer with whom they had observed simultaneously during the training period or later. The scores of each student were also compared with every other with whom they were paired during the training period. Table 2 gives the results of this comparison. As will be seen below, the mean per cent of agreement of *B* with every other observer was .40 during the first half and .39 during the last half of the twenty-minute period; and the mean per cent of agreement of *W* with every other observer was

Observers	First Half of Period	Last Half of Period
B and other observers	.40	.39
W and other observers	.32	.44
H and other observers	.49	.47
J and other observers	.57	.43
C and other observers	.45	.36
V and other observers	.36	.30
D and other observers	.51	.37
M and other observers	.38	.48
P and other observers	.50	.56
Mean of Means	.44	.42

.32 and .44 for the two respective halves. The mean of the mean per cents of the agreements of each observer with every other observer was .44 for the first half and .42 for the last half.

Returning now to the problem of the amount of agreement between *B* and *W* on each item when they observed together thirty children in turn (Series IV) on the six items which had normal distributions, the coefficients of correlation have been given in Table 1. For all the other items on the observation sheet, the distributions on these being heavily skewed or having a large number of scores piled at either extreme of the scale, a simple percentage method was used to find the agreement between the observers. Table 3 gives the percentages of agreement between the two observers when their total scores were compared item by item. In

Table 2

Number of Instances Recorded and the Per Cent of Absolute Agreement, Minute by Minute, on All Items Between Each Observer During the First and Last Half of a Twenty-Minute Observation Period in the Training Periods and Series I, II, and III

Observers	Observation Period			
	First Half		Last Half	
	Instances	Per Cent Agreement	Instances	Per Cent Agreement
B and J	275	.47	263	.55
B and V	204	.39	229	.33
B and M	193	.38	180	.48
B and H	165	.49	166	.43
B and W	161	.54	168	.65
B and C	45	.25	37	.21
B and D	37	.31	22	.09
W and C	83	.29	56	.16
W and H	74	.55	57	.82
W and J	72	.26	61	.35
W and P	27	.18	25	.41
H and J	48	.57	69	.33
H and V	107	.35	112	.28
J and V	51	.82	71	.28
J and D	79	.71	78	.64
C and P	108	.82	107	.71

this comparison two equal total scores were called perfect agreement, regardless of whether the tabulations concurred minute by minute. Items wherein both observers gave zero scores were omitted from this table. As may be seen there was perfect agreement on five items, agreement within one point on thirteen items, agreement within three points on twenty-four items, and agreement on all items within five points.

To obtain a more rigorous comparison of the agreements between the two observers, their scores on Series IV were next analyzed for minute by minute agreement on each item when zero scores of both observers for the same child were included. It was found that the items had approximately the same relation in agreement as before, but that the per cent of cases of perfect agreement (under 100) was higher in every instance. This is undoubtedly due to the inclusion of instances of zero scores of both observers.

Table 3

Percentages of Agreement Between the Two Main Observers When Their Total Scores on the Behavior of Thirty Children Are Compared With the Zero Scores Omitted and the Zero Scores Included

Behavior Items	Per Cent of Agreement											
	Zero Scores Omitted						Zero Scores Included					
	Children Observed	Perfect	Within One Point	Within Two Points	Within Three Points	Within Five Points	Children Observed	Perfect	Within One Point	Within Two Points	Within Three Points	Within Five Points
Constructive activity	18	50	89	100	100	100	30	73	90	100	100	100
Manipulative activity	23	48	87	96	96	100	30	57	83	93	97	100
Dramatic activity	20	50	80	95	95	100	30	63	83	93	97	100
Interest in stories	3	100	100	100	100	100	30	100	100	100	100	100
Interest in pictures	7	71	100	100	100	100	30	93	100	100	100	100
Interest in music	8	50	88	88	88	100	30	83	93	97	97	100
Self-responsibility (+)	6	50	100	100	100	100	30	77	87	97	100	100
Leadership (+)	15	33	67	87	100	100	30	70	87	93	100	100
Leadership (—)	15	53	93	100	100	100	30	77	97	100	100	100
Independence of adult (—)	7	43	71	86	86	100	30	87	97	97	97	100
Kindness (+)	2	00	100	100	100	100	30	93	100	100	100	100
Kindness (—)	5	60	100	100	100	100	30	90	97	100	100	100
Conformity (+)	26	42	81	92	100	100	30	43	80	93	100	100
Conformity (—)	12	75	100	100	100	100	30	80	93	100	100	100
Fair play (+)	5	20	100	100	100	100	30	87	100	100	100	100
Fair play (—)	4	75	100	100	100	100	30	97	100	100	100	100

Responsibility for others (+)	3	00	67	67	100	100	30	93	100	100	100	100
Responsibility for others (—)	1	100	100	100	100	100	30	97	100	100	100	100
Responsibility for toys (+)	3	67	100	100	100	100	30	100	100	100	100	100
Responsibility for toys (—)	4	00	75	75	100	100	30	87	97	97	100	100
Laughing	17	24	71	77	100	100	30	60	83	93	100	100
Stability (+)							30	70	90	97	100	100
Self-assertion (+)	12	33	83	92	100	100	30	70	87	97	100	100
Self-assertion (—)	4	25	75	75	100	100	30	87	93	97	100	100
Ability to face situation (+)	1	100	100	100	100	100	30	100	100	100	100	100
Ability to face situation (—)	1	100	100	100	100	100						
Crying	2	100	100	100	100	100	30	100	100	100	100	100
Number of items having 100 per cent agreement		5	13	15	22	26		5	11	15	24	28

Next, comparisons were made of the amounts of agreement (Series IV) minute by minute when all zero scores given by both observers were omitted. This was to avoid spuriously high agreement on those items of behavior having lowest frequency. Actual agreement on positive scores was obtained by comparing correlations of minute by minute observations, and also by comparing tabulations checked within the same or adjacent minutes. (For example,

Table 4

Percentages of Agreement in Regard to Time Between the Two Main Observers When Their Total Scores on the Behavior of Thirty Children Are Compared Minute by Minute With the Zero Scores Omitted

Behavior Items	Tabulations by One or Both Observers	Absolute Agreement		Agreement Within the Same or an Adjacent Minute	
		Number	Per Cent	Number	Per Cent
Constructive activity	93	82	88	82	88
Manipulative activity	99	73	74	75	76
Dramatic activity	129	109	85	111	86
Interest in stories	14	14	100	14	100
Interest in pictures	19	17	89	17	89
Interest in music	37	27	73	27	73
Self-responsibility	6	2	33	3	50
Leadership (+)	48	28	58	28	58
Leadership (—)	47	27	57	34	72
Kindness (+)	3	1	33	1	33
Kindness (—)	6	4	67	4	67
Conformity (+)	70	39	56	42	60
Conformity (—)	23	14	61	15	65
Fair play (+)	6	2	33	2	33
Fair play (—)	6	5	83	5	83
Responsibility for others (+)	9	7	77	7	77
Responsibility for others (—)	4	1	25	1	25
Responsibility for toys (+)	2	2	100	2	100
Responsibility for toys (—)	6	0	00	0	00
Laughing	46	19	41	20	43
Stability (+)	587	569	97	572	97
Self-assertion (+)	23	8	35	9	39
Self-assertion (—)	10	3	30	4	40
Ability to face situation (+)	1	1	100	1	100
Ability to face situation (—)	1	1	100	1	100
Crying	2	2	100	2	100

the same behavior occurring near the turning of one minute to another might be checked at the fifteenth minute by one observer and at the sixteenth by the other.) Table 4 gives the percentages of agreement obtained by this method. It may be seen that during these ten hours of thirty disparate observation periods (twenty minutes observation by two observers at once on each child) the following items of behavior had a frequency score of less than 6: responsibility for others (—), responsibility for toys (+), ability to face a situation (+) and (—), and crying. There was an agreement between observers of less than 70 per cent on these items: self-responsibility, leadership (+), kindness (+) and (—), conformity (+) and (—), fair play (+), responsibility for others (—), responsibility for toys (—), laughing, and self-assertion (+) and (—). The data also indicate that there were comparatively few instances where the same behavior was not checked within exactly the same minute; the greatest number of discrepancies was in scoring leadership (—), where there was absolute agreement on twenty-seven instances and agreement with the same or an adjacent minute on thirty-four instances.

A summary of the reliability on each item of the scores of the two observers is found on page 77. Here are included those items having a frequency and percentage of agreement sufficiently high to warrant further treatment of the data. There are also included the coefficients of correlations above .70 on the normally distributed items. The number of items of behavior which the two observers could look for at once and recognize sufficiently often to agree upon seems in this study limited to the fifteen listed below:

Behavior Items	r	P.E.	Per Cent of Agreement
Language frequency	.960	± .010	
Physical activity	.972	± .007	
Group play (+)	.957	± .010	
Group play (—)	.951	± .012	
Watching others (+)	.731	± .057	
Constructive activity			88
Manipulative activity			76
Dramatic activity			86
Interest in stories			100
Interest in pictures			89
Interest in music			73
Leadership (—)			72
Fair play			83

Behavior Items	r	P.E.	Per Cent of Agreement
Responsibility for others (+)			77
Stability (+)			97

There may be three reasons for the low frequencies and low agreements on the other items not included. One is that the definitions were not sufficiently clear or specific; another reason may be that the definitions were not minute enough to catch the finer aspects of the children's behavior; a third may be that some kinds of behavior happen much too infrequently to be caught in any sampling of time except a very much longer one than this study includes. Undoubtedly each of these reasons has had a part in the results.

Adequacy of the Sampling.—Little investigation is reported in the literature concerning the length of time needed for an adequate sampling of various aspects of behavior. Current practice varies from periods lasting many consecutive hours to a recent study where short samplings of one minute in length are used.

In general, the shortest sampling that will give satisfactory results is desirable both from the point of view of the child and the observer.

In this study short repeated samplings of twenty minutes were decided upon, with a ten-minute intermission after one observation before beginning the study of a second child. Equally arbitrarily, it was decided to combine five such periods into a series and to use the results of such a series as the child's score for the period thus included. It will be remembered that the periods came about once in four days and that a series covered a range of about a month. An attempt has been made to investigate the adequacy of scores obtained in this way. For this analysis the scores on Series IV, V, and VI were used.

First, the scores on each of five single twenty-minute periods were correlated with the mean score of the five combined. The Pearson product-moment formula was used. The results are given in Table 5. As may be seen the agreements vary widely. The highest agreements are found in language frequency. All the agreements in group play (+) and (—) are significant. The lowest agreements are in physical activity. Here they are not only low but three are not even significant. In each of the items of manipulative activity, dramatic activity, and watching others there is one correlation which is insignificant.

The results of an analysis of the percentages of agreement of observation scores between one twenty-minute period (the third) with the total score on the series of which it is a part, on those items wherein the distribution was skewed, are given below:

Behavior Items	Perfect	Within One Point	Within Three Points
Constructive activity	9	27	67
Interest in stories	76	94	100
Interest in pictures	64	88	100
Interest in music	36	67	94
Leadership (—)	21	97	100
Fair play (—)	58	97	100
Responsibility for others (+)	94	100	100
Stability (+)	39	82	88

All scores from 0 to 20 are included. As may be seen all but three of these items had scores within three points of agreement. However, this is misleading because it does not discriminate between agreements on items having low or high frequencies. The chances are greater for higher percentages of agreement on scores low enough to have a narrow range.

Table 5

Correlations of Observation Scores on Each of Five Single Twenty-Minute Periods With Mean of Scores on Five Periods

Behavior Items	Periods									
	1		2		3		4		5	
	r	P.E.	r	P.E.	r	P.E.	r	P.E.	r	P.E.
Language frequency	.861	± .031	.824	± .038	.887	± .025	.542	± .083	.671	± .065
Physical activity	.654	± .067	.309	± .107	.179	± .114	.575	± .079	.354	± .102
Manipulative activity	.363	± .102	.584	± .077	.694	± .082	.681	± .063	.556	± .081
Dramatic activity	.621	± .072	.746	± .052	.689	± .062	.784	± .045	.284	± .108
Group play (+)	.595	± .076	.791	± .045	.431	± .095	.883	± .026	.720	± .057
Group play (—)	.525	± .085	.511	± .087	.769	± .048	.442	± .095	.777	± .047
Watching others (+)	.636	± .070	.718	± .056	.659	± .066	.357	± .102	.679	± .064

To find the effect of lengthening the observation without duplicating any periods in time, scores of four twenty-minute periods were compared with scores on four alternate periods. The results may be seen in the following tabulation:

Behavior Items	r	P.E.
Language frequency	.672	± .067
Physical activity	.322	± .111
Manipulative activity	.593	± .079
Dramatic activity	.807	± .043
Group play (+)	.535	± .088
Group play (—)	.562	± .085
Watching others (+)	.401	± .103

Here the coefficients range from .807 ± .043 in dramatic activity to .322 ± .111 in physical activity. The latter correlation is insignificant because of the large probable error, and the correlation in watching others is scarcely significant. Per cents of agreement for traits in which a normal distribution of the items was not found are given below:

Behavior Items	Perfect	Within One Point	Within Three Points
Constructive activity	10	73	100
Interest in stories	63	93	100
Interest in pictures	57	87	100
Interest in music	33	60	100
Leadership (—)	30	97	100
Fair play (—)	50	96	100
Responsibility for others (+)	83	100	100
Stability (+)	20	70	70

To find out whether the degree of agreement in scores as indicated above was influenced by the passage of time between the eight periods (about two months), correlations were obtained between two twenty-minute periods (first and third) and two alternate periods (second and fourth), thus limiting the time to about one month. The results are given below:

Behavior Items	r	P.E.
Language frequency	.714	± .058
Physical activity	.112	± .103
Manipulative activity	.305	± .106
Dramatic activity	.833	± .036
Group play (+)	.398	± .099
Group play (—)	.317	± .106
Watching others	.366	± .102
Stability (+)	.068	± .117

Here is found almost the same relative ranking of coefficients. Dramatic activity has the highest place with a coefficient of .833 ± .036, language frequency next with a coefficient of .714 ± .058, and physical activity lowest with a coefficient of .112 ± .103. Since the range of time in these computations is about the same as the number of weeks in a series, the coefficients obtained in this table were substituted in the Spearman-Brown prophecy formula to estimate the reliability of the scores on a series, or five periods. The results are as follows:

Behavior Items	r	P.E.
Language frequency	.862	± .031
Physical activity	.239	± .110
Manipulative activity	.523	± .086
Dramatic activity	.926	± .016
Group play (+)	.623	± .072
Group play (—)	.537	± .083
Watching others	.591	± .076
Stability (+)	.154	± .115

Inspection indicates that in five twenty-minute periods, which are scattered over an interval of about a month but covering, in general, activities included in an entire school morning, the scores most stable are those of dramatic activity and language frequency, where the estimate coefficients are .926 ± .016 and .862 ± .031 respectively. The scores on manipulative activity, group play (+) and (—), and watching others are fairly consistent while physical activity scores vary widely from period to period. It will be remembered that no two periods in these comparisons came at the same hour of the morning, so that one would expect to find a variation in behavior from period to period on this account, especially in such behavior as physical activity where the hour of the day determined to some extent the amount of access the child had to large play apparatus.

As a further check on the agreements, particularly to examine the variability of physical activity scores, correlations were obtained between scores during the fifth and seventh periods with the sixth and eighth periods on physical activity and group play (+) and (—). These correlations were found to be:

Behavior Items	r	P.E.
Physical activity	.287	± .113
Group play (+)	.383	± .121
Group play (—)	.445	± .099

These are substantially the same as the agreements on the same behavior of the first and third periods with the fourth and fifth periods.

To find out the reliability of the scores of a single period of twenty consecutive minutes, correlations were obtained between each half of thirty twenty-minute periods. For this computation Series IV was used. The average scores of two observers watching simultaneously thirty children in turn for a period of twenty minutes for each child were correlated. The correlations of observation scores on two halves of a twenty-minute observation period and coefficients of reliability estimated for the period as a whole are given below:

Behavior Items	r	P.E.	r	P.E.
Language frequency	.736	± .057	.848	± .033
Physical activity	.531	± .088	.694	± .061
Manipulative activity	.497	± .092	.664	± .066
Dramatic activity	.485	± .094	.653	± .067
Group play (+)	.389	± .105	.560	± .081
Group play (—)	.537	± .088	.699	± .060
Watching others	.377	± .106	.548	± .082

Here the highest agreement is language frequency, .736 ± .057, and the lowest is watching others, .377 ± .106. Coefficients of reliability for the whole twenty-minute period estimated from the agreement within halves are also given, the Spearman-Brown prophecy formula being again used. The range here is from .548 ± .082 to .848 ± .033. Apparently short periods during the same consecutive time correlate to about the same degree as longer periods which occur on different weeks at different hours of the day. However, there are some important differences. Dramatic activity when sampled at different days and hours yields high consistency (.926 ± .016), but it does not seem to occur as consistently (.653 ± .067) throughout a whole period of twenty consecutive minutes. Physical activity, on the other hand, is fairly consistent during a consecutive period (.694 ± .061), but very inconsistent (on all computations) when compared from one day or hour to another day or hour. Scores on group play (—) and manipulative activity show the same trend as physical activity though not in so marked a degree, while language frequency and watching others show about the same consistency, respectively, whether sampled at consecutive or disparate intervals. Perhaps behavior

which occurs in longer units needs to be sampled at more frequent intervals, while patterns having a briefer interest-span, as dramatic activity, need longer consecutive samplings.

Summary of the Method.—From these data thus analyzed one may conclude that the observers were trained to observe several aspects of a child's behavior at a time, when the definitions were sufficiently specific and clear. Some forms of behavior, especially those happening infrequently or involving complex and subtle reactions, could not be measured. These observers were able to agree substantially on fourteen items.

It would also appear that the scores on a series of five twenty-minute periods, spread systematically throughout the hours of the morning and the weeks of the month, yield, on six items at least, scores sufficiently stable to be considered further in the section on the Problems of Personality Development. Special caution will need to be observed in interpreting the results of analysis of physical activity scores which follow in the Problems of Personality Development. The scores on this item are reliable only when single periods are considered.

Problems of Personality Development

From the standpoint of children's personality development it was decided to limit the scope of this study to five aspects of the subject, namely, (1) age differences, (2) sex differences in choice of play activities, (3) growth, (4) the relationship between use of language and types of play, and (5) the relationship between group play and types of play activities.

Age Differences.—Summaries of the mean scores for each of four age groups in fifteen items of behavior for Series I, Series III, and Series V are given in Tables 6 and 7. The age groupings were made on a six month basis as follows: two years, zero months, zero days to two years, five months, twenty-nine days; two years, six months, zero days to two years, eleven months, twenty-nine days; three years, zero months, zero days to three years, five months, twenty-nine days; three years, six months, zero days to three years, eleven months, twenty-nine days. The groups were small, the first group comprising seven children, the second group nine, the third seven, and the fourth five. The items for which scores are given in these tables are those for which the highest reliability was obtained, as described under the Problem of Method.

Table 6
Means and Standard Deviations for Each of Four Age Groups on Six Items of Behavior for Series I, III, and V

Age		Children	Behavior Items											
Years Months Days	Years Months Days		Language Frequency		Physical Activity		Group Play (+)		Group Play (—)		Watching Others		Stability (—)	
			Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Series I														
2 0-0	to 2- 5-29	7	7.57	3.31	9.75	1.67	2.58	2.10	2.94	1.98	6.86	3.84	.48	.73
2-6-0	to 2-11-29	9	6.11	2.56	8.91	3.71	3.65	3.60	3.08	2.58	6.70	2.93	.13	.19
3-0-0	to 3- 5-29	7	9.17	2.96	10.11	3.48	7.71	4.76	2.02	3.11	3.14	2.10	.00	.00
3-6-0	to 3-11-29	5	9.76	3.01	9.15	3.25	5.42	2.89	1.75	1.57	5.78	4.04	.22	.30
Series III														
2-0-0	to 2- 5-29	7	7.77	5.03	4.07	2.38	5.30	3.27	9.00	4.76	4.07	2.92	.03	.07
2-6-0	to 2-11-29	9	8.73	4.93	5.04	2.93	7.49	4.22	6.27	4.19	3.49	1.70	.24	.46
3-0-0	to 3- 5-29	7	13.53	4.02	9.03	3.80	11.12	6.16	6.20	5.82	2.85	1.80	.20	.33
3-6-0	to 3-11-29	5	13.68	1.82	6.32	2.44	10.32	2.93	3.52	2.67	3.00	1.11	.36	.54
Series V														
2-0-0	to 2- 5-29	7	10.73	4.16	8.70	2.58	9.60	2.27	10.04	2.55	2.97	3.60	.57	1.00
2-6-0	to 2-11-29	9	13.09	2.59	8.48	2.03	10.40	2.52	9.18	2.57	1.91	.99	.21	.14
3-0-0	to 3- 5-29	7	14.02	3.27	8.53	2.12	12.60	5.34	7.70	5.52	1.60	1.30	.30	.36
3-6-0	to 3-11-29	5	13.48	1.28	6.88	1.63	11.28	2.87	9.52	3.74	1.64	1.05	.28	.26

Table 7
Mean Scores for Each of Four Age Groups on Nine Items of Behavior for Series I, III, and V

Age			Behavior Items								
Years Months Days	Years Months Days	Children	Constructive Activity	Manipulative Activity	Dramatic Activity	Interest in Stories	Interest in Pictures	Interest in Music	Leadership (—)	Fair Play (—)	Responsibility for Others (+)
Series I											
2-0-0 to 2- 5-29		7	1.42	4.99	2.28	.20	.53	.68	.10	1.02	.18
2-6-0 to 2-11-29		9	1.17	3.89	1.16	.97	.93	.43	.35	.31	.18
3-0-0 to 3- 5-29		7	.79	1.09	4.02	.21	.40	.00	.22	.69	.03
3-6-0 to 3-11-29		5	1.25	1.26	2.90	.00	.20	.20	.10	.00	.00
Series III											
2-0-0 to 2- 5-29		7	1.67	3.97	3.13	2.50	3.10	1.03	.13	.67	.03
2-6-0 to 2-11-29		9	3.18	3.42	3.44	1.20	2.00	.82	.40	.33	.11
3-0-0 to 3- 5-29		7	2.62	1.55	5.28	1.00	1.85	.78	.60	.15	.10
3-6-0 to 3-11-29		5	4.12	2.08	5.48	.52	1.32	.16	.20	.04	.00
Series V											
2-0-0 to 2- 5-29		7	2.80	4.37	3.03	.17	.47	1.00	.50	.30	.00
2-6-0 to 2-11-29		9	3.96	2.35	4.43	.26	.23	1.05	.45	.10	.09
3-0-0 to 3- 5-29		7	2.58	1.57	8.23	.13	.02	.56	.50	.38	.00
3-6-0 to 3-11-29		5	3.52	2.16	7.64	.04	.20	.72	.24	.08	.00

On inspection, it appears from these tables that in the main scores of the first and second groups tend to be similar, as do also the third and fourth groups. In other words, the scores of children whose ages run from twenty-four to thirty-five months inclusive tend to group fairly close together for most items, as do the scores of children from thirty-six months to forty-seven months inclusive. It was decided, therefore, to group the individuals on a twelve month basis, making two groups—one composed of sixteen children ranging in age from two years, zero months, zero days to two years, eleven months, twenty-nine days and the other composed of twelve children ranging in age from three years, zero months, zero days to three years, eleven months, twenty-nine days. Certain items were then selected for careful analysis in an attempt to see

whether real differences existed. Only such items were used for which a correlation between observers of .70 or over had been obtained, or a percentage of agreement of 75 or over with a fairly normal distribution. This limited the possibility to eight items, namely, language frequency, physical activity, constructive activity, manipulative activity, dramatic activity, group play (+) and (—), and watching others. Finally, when scores were so nearly alike as to exclude a possibility of a real difference obtaining, such items were omitted from further calculations. This final check excluded physical activity and constructive activity from Series I, and constructive activity from both Series III and Series V.

The scores for the two year group were now compared with the scores for the three year group for each series. Fisher's formula[2] for determining the significance of the difference between means was used. The results are given in Table 8. According to the data for these children there was a real difference between the scores of these two- and three-year-old children at the time the observations included in Series I were taken for the items of language frequency, manipulative activity, dramatic activity, group play (+), and watching others, but not for group play (—). In each of the items whose scores showed a real difference the scores of the three year group were consistently higher, except for watching others and manipulative activity. The mid-point in time for Series I was about November 1, so that the children had been in school approximately a month.

The observations included in Series III were made approximately three months later, the mid-point of the observations falling on February 1. There was still a real difference between the scores of the two groups in language frequency, manipulative activity, dramatic activity, group play (+), and in addition in physical activity. There was still no real difference in group play (—) (playing alone), and no longer a difference in the item watching others. It is possible that the difference between scores in physical activity, which was not present at the time of Series I, is an artificial one due to the fact that at this time of the year (February) the three-year-old children were spending more time out-of-doors than were the two-year-olds.

---

[2] Fisher, R. A.: Statistical Methods for Research Workers. 2nd ed., rev. and enl. London: Oliver & Boyd, 1928. Pp. xi, 269. (p. 99-112)

Table 8

Significance of Difference Between the Means of Scores for Certain Items of Behavior for Two- and Three-Year-Old Children in Series I, III, and V

Behavior Items	Age, Years		t	P when n = 26
	2	3		
Series I				
Language frequency	6.75	9.42	2.26	.05
Manipulative activity	4.37	1.17	3.28	.01
Dramatic activity	1.65	3.55	2.21	.05
Group play (+)	3.18	6.76	2.69	.01
Group play (—)	3.02	1.91	1.15	.20
Watching others	6.77	4.24	1.91	.05
Series III				
Language frequency	8.35	13.58	3.10	.01
Physical activity	4.65	7.98	2.66	.01
Manipulative activity	3.64	1.76	2.94	.01
Dramatic activity	3.32	5.35	2.09	.05
Group play (+)	6.61	10.81	2.32	.02
Group play (—)	7.36	5.17	1.16	.20
Watching others	3.72	2.91	1.04	.30
Series V				
Language frequency	12.08	13.82	1.35	.2
Physical activity	8.57	7.74	.85	.4
Manipulative activity	3.21	1.80	2.24	.05
Dramatic activity	3.98	8.00	3.69	.01
Group play (+)	10.06	12.09	1.37	.2
Group play (—)	9.55	8.40	.73	.5
Watching others	2.36	1.62	1.40	.2

In Series V, the mid-point of whose observations fall on about May 1, a real difference between the scores of the two groups is obtained for only two items, manipulative activity and dramatic activity. Again there is no real difference between the scores for physical activity, the three year group having lost a little in the score and the two year group having gone back to approximately the score of the first series. The fact that the language scores at this time do not present a real difference can be explained on the basis that the two year group increased its language score 50 per cent in the three months intervening between February 1 and May

1, while the score of the three year group remained essentially the same. The change for the item group play (+), in which a real difference obtained between the two groups in Series I and Series III and in which no real difference is apparent in Series V, can be explained on a similar basis. The two year group tripled its score from November 1 to May 1 and made a 50 per cent increase from February 1 to May 1, while the three year group almost doubled its score from November 1 to May 1 and made a gain of approximately 20 per cent from February 1 to May 1, though its score is still the higher of the two on May 1. There is again no real difference between the groups in watching others. The mean scores for this item stand in nearly the same relation now that they did in each of the series, but there is greater individual variation in the two year group.

On the basis of these data a few tentative conclusions may be drawn as to age differences. Using Series I, when the mean age of the two year group was two years, six months and of the three year group, three years, six months, it seems that in the case of the children considered in this study the three-year-olds talked more, were more likely to engage in imaginative, dramatic activity, and were more likely to play coöperatively in a group than were the two-year-old children. The two-year-old children spent more time in manipulative activity than the three-year-old children.

In answer to a general statement frequently made that young children play alone most of the time, it is not possible to say from the data that there is a real difference between the scores of the two groups in playing alone, known as group play (—), though there is a possibility of a real difference. There is a real difference in the item watching others. It may be said, then, that these two-year-old children, when the mean age of the group was two years, six months, played in a group less and spent more time in watching the activities of others than did the three-year-old children.

It was felt that by considering the children series by series it was possible that the scores were somewhat affected by the length of time the children had been in school, and by the training of the observers. A regrouping of children was made, therefore, on an actual age basis so that the four groups consisted of six children aged two years, three months; six children two years, nine months; seven children three years, three months; and ten children three years, nine months. By this arrangement the scores of three young

children which had not been used in any series were introduced. In the case of each individual the observation series whose mid-point nearest approached the date on which the child reached the age desired for the group was used. Table 9 shows a comparison of the scores of children aged two years, three months with children three years, three months and children two years, nine months with children three years, nine months. In a comparison of the scores of children two years, three months with children three years, three months a real difference is found in the case of language frequency, with a possibility of a difference in dramatic activity. No real difference is shown in the case of group play (+). This is due in part to a single child in the two year, three month group who does not appear in another series and whose score for this item was nearly twice that of any in her own group and slightly higher than any in the three year, three month group. However, with so small a number it is impossible to say which of the mean scores gives the truer picture. In comparing the scores of children aged two years, nine months with those of children three years, nine months, a real difference is found in the cases of manipulative activity and of group play (+).

Table 9

Significance of Difference Between the Means of Scores for Certain Items of Behavior When Children Whose Actual Ages Were Two Years, Three Months and Two Years, Nine Months at Time of Observation Are Compared With Children Whose Actual Ages Were Three Years, Three Months and Three Years, Nine Months

Behavior Items	2 Years, 3 Months	3 Years, 3 Months	t	P when n=11	2 Years, 9 Months	3 Years, 9 Months	t	P when n=11
Language frequency	7.48	11.44	2.08	.05	8.78	11.44	1.00	.3
Constructive activity	2.13	4.68	1.54	.2	3.20	4.68	.89	.4
Manipulative activity					6.68	2.40	2.82	.02
Dramatic activity	1.81	4.47	1.58	.1	2.08	4.47	1.37	.2
Group play (+)	7.47	9.56	1.00	.3	3.76	9.56	2.61	.02
Group play (—)	8.58	6.42	.66	.5	4.49	6.42	.70	.5

From the data so far considered it seems safe to conclude that indications point toward a real difference between two- and three-

year-old children in language frequency, manipulative activity, dramatic activity, group play (+), and watching others.

Sex Differences in Choice of Activity.—A summary of the comparison of mean scores for each sex and age in regard to choice of four types of play activities is given in the following tabulation:

Play Activities	Mean Scores	
	Boys	Girls
	2 Years	
Physical	9.63	7.78
Constructive	4.23	2.88
Manipulative	3.10	3.29
Dramatic	3.93	4.01
	3 Years	
Physical	9.04	6.24
Constructive	2.38	3.72
Manipulative	1.72	1.68
Dramatic	8.54	6.52
	All Ages	
Physical	9.51	7.17
Constructive	2.83	3.24
Manipulative	2.60	2.80
Dramatic	6.23	4.52

In the two year group there were six boys and seven girls, in the three year group ten boys and five girls, and in the total group eighteen boys and fifteen girls. On inspection it appears that there may be a real difference between the boys' and girls' scores for physical activity in all the groups, and for dramatic activity in the three year group and the total group. Fisher's formula (See footnote 2) for determining the significance of difference between the means was applied to the data. The results, showing the significance of the difference between the means of scores for physical and dramatic activities according to age and sex, are given in the following tabulation:

Age, Years	Children	Boys	Girls	t	P
		Physical Activity			
2	12	9.63	7.78	1.52	.2
3	13	9.04	6.24	2.07	.05
All Ages	31	9.51	7.17	2.89	.01

Age, Years	Children	Boys	Girls	t	P
		Dramatic Activity			
3	12	8.54	6.52	1.29	.2
All Ages	31	6.23	4.52	1.39	.2

It is found that a significant difference obtains in the time spent in physical activity between the scores of three-year-old boys and three-year-old girls and between the scores of all the boys and all the girls, the boys having the larger score. In the two year group also there is a tendency for the boys to spend more time in active physical play than the girls. Without additional data, one is at a loss to account for this difference, which seems to indicate a definite trend.

The second part of the above tabulation gives the results when Fisher's formula was applied to the scores for dramatic activity. Though no real difference can be claimed between the scores for boys and girls, there is a definite tendency for the boys to engage in dramatic types of play oftener than the girls.

Growth.—In studying the growth of the various age groups in the several items of behavior it was decided to use the data of Series I, Series III, and Series V only, since Series IV was not complete and since there was approximately a three month interim between the dates marking the mid-points of Series I and Series III, and also Series III and Series V. The mean scores for the fifteen items having the highest reliability are given for each of the three series for each age group in Tables 6 and 7. Analyses of the meaning of the differences in scores between the first and third series, between the third and fifth, and between the first and fifth were made by the means of Fisher's formula for determining the significance of the difference between means. For this purpose the children were regrouped on a year basis for seven items—language frequency, constructive activity, manipulative activity, dramatic activity, group play (+), group play (—), and watching others. These items were selected because a correlation of .70 or above between the main observers had been obtained for the first one and the last three, and a percentage of agreement of 75 or above for the other three (physical activity omitted). Fisher's formula was also used for certain of these items in which a possibility of a real difference was apparent when the six month age groups were considered. The results are shown in Table 10.

Table 10

Significance of the Difference Between the Means of the Scores for Certain Items of Behavior in Series I and III, Series III and V, and Series I and V for Two- and Three-Year-Old Children

Behavior Items	Series I	Series III	t	P when n=26	Series III	Series V	t	P when n=25	Series I	Series V	t	P when n=24
2 Years												
Language frequency	6.75	8.35	1.60	.1	8.35	12.08	2.22	.05	6.75	12.08	4.30	.01
Constructive activity	1.28	8.35	5.36	.01	2.57	3.46	1.20	.2	1.28	3.46	3.82	.01
Manipulative activity	4.37	3.64	.78	.4	3.64	3.21	.58	.6	4.37	3.21	1.18	.3
Dramatic activity	1.65	3.32	2.17	.05	3.32	3.98	1.53	.1	1.65	3.98	2.91	.01
Group play (+)	3.18	6.61	2.62	.01	6.61	10.06	2.63	.01	3.18	10.06	7.32	.01
Group play (—)	3.02	7.36	3.19	.01	7.36	9.55	1.48	.2	3.02	9.55	7.02	.01
Watching others	6.77	3.72	2.85	.01	3.72	2.36	1.84	.1	6.77	2.36	4.41	.01
3 Years												
Language frequency	9.42	13.58	3.13	.01	13.58	13.81	.19	.9	9.42	13.81	3.68	.01
Constructive activity	.99	3.20	2.12	.05	3.20	2.94	.23	.8	.99	2.94	2.10	.05
Manipulative activity	1.17	1.76	1.00	.3	1.76	1.80	.08	.9	1.17	1.80	1.24	.2
Dramatic activity	3.55	5.35	1.67	.1	5.35	8.00	2.52	.02	3.55	8.00	3.77	.01
Group play (+)	6.76	10.81	2.05	.05	10.81	12.09	.64	.5	6.76	12.09	2.89	.01
Group play (—)	1.91	5.17	1.93	.05	5.17	8.40	1.57	.1	1.91	8.40	3.86	.01
Watching others	4.24	2.91	1.24	.2	2.91	1.61	2.28	.02	4.24	1.61	2.55	.02

When the scores for the third series and those for the first series were compared for the seven items mentioned, the two-year-old group was found to have made a real advance in constructive activity, dramatic activity, group play (+), and group play (—), and a real decrease in watching others. In the three-year-old group real growth was found in language frequency, constructive activity, group play (+), and group play (—).

The scores of the fifth series as compared with those of the third show a real increase in the items of language frequency and group play (+) for the two-year-old group and in dramatic activity for the three-year-old group, as well as a real decrease in watching others for the latter group.

In both the two- and three-year-old groups real changes were effected in all items except manipulative activity, namely, language frequency, constructive activity, dramatic activity, group play (+), group play (—), and watching others when the scores for Series I and Series V were considered. In every item except that of watching others the scores for the fifth series were larger than those for the first.

Table 11 gives the results for the groups arranged on a six month division when Fisher's formula was applied to the items of Series I and Series III and Series III and Series V, whose scores on inspection promised a possibility of a real difference. For the first age group in Series I and Series III, composed of children ranging in age from two years, zero months, zero days to two years, five months, twenty-nine days, a real difference obtained for two items only—physical activity and group play (—). The scores for the next group, ages two years, six months, zero days to two years, eleven months, twenty-nine days, show a real difference in five items —physical activity, constructive activity, dramatic activity, group play (+), and watching others. In the third group, ages three years, zero months, zero days to three years, five months, twenty-nine days, only one item, language frequency, has scores presenting a real difference. Two items, language frequency and group play (+), show a real difference in scores in the fourth age group—three years, six months, zero days to three years, eleven months, twenty-nine days.

Table 11 again presents differences in scores in a comparison between Series III and Series V. Real differences were obtained for group play (+) in the first age group, for language frequency

Table 11

Significance of the Difference Between the Means of the Scores for Certain Items of Behavior in Series I and III and Series III and V for Each of Four Age Groups

Behavior Items	Children	Series I	Series III	t	P	Children	Series III	Series V	t	P
2 years, 0 months, 0 days to 2 years, 5 months, 29 days										
Physical activity	11	9.75	4.07	4.65	.01	10	4.07	8.70	1.88	.1
Group play (+)	11	2.58	5.30	1.66	.1	10	5.30	9.60	2.30	.05
Group play (—)	11	2.94	9.00	2.83	.02					
2 years, 6 months, 0 days to 2 years, 11 months, 29 days										
Language frequency						15	8.73	13.09	2.11	.05
Physical activity	16	8.91	5.04	2.31	.05					
Constructive activity	16	1.17	3.18	2.45	.02					
Dramatic activity	16	1.16	3.44	2.07	.05					
Group play (+)	16	3.65	7.49	1.90	.05	15	7.49	10.40	1.60	.1
Group play (—)	16	3.08	6.27	1.83	.1	15	6.27	9.18	1.82	.1
Watching others	16	6.70	3.38	2.79	.02	15	3.49	1.91	2.16	.05
3 years, 0 months, 0 days to 3 years, 5 months, 29 days										
Language frequency	13	9.17	13.53	2.20	.05					
Dramatic activity						14	5.28	8.22	1.91	.1
3 years, 6 months, 0 days to 3 years, 11 months, 29 days										
Language frequency	8	9.76	13.68	2.23	.05					
Dramatic activity	8	2.90	5.48	1.99	.1					
Group play (+)	8	5.42	10.32	2.39	.05					
Group play (—)						8	3.52	9.52	2.62	.02

and watching others in the second group, and for no items in the third and fourth age groups.

The data show, then, a significant increase in scores from Series I (November) to Series V (May) for both the two and three year groups in the items language frequency, constructive activity, dramatic activity, group play (+), and group play (—), with a corresponding decrease for the item watching others. There was no appreciable difference in score for the item physical activity for the six month period in either age group. This item, however, had a significant drop in score from November to February for the two year group and a subsequent increase from February to May, a fact that is probably explainable on a basis of decrease of accessibility of larger equipment during the coldest months when the children spend more time indoors.

Relationship Between Language Frequency and Types of Play Activity.—The scores showing the concurrence of language with each of the types of activity were obtained from the original observation sheets by giving one point for each minute in which there was already recorded a score for language and a score for one of the activities. In a few instances it was found that a child had engaged in two activities, and also had a score for language, during the same minute. In such a case each activity was given one point for concurrence with language. It is believed that the number of cases in which this occurred is too small to affect the relationship between scores. The final scores were given in percentages. For instance, to obtain the score for percentage of language frequency concurrent with physical activity, the number of concurrences were divided by the child's score for language frequency. The score thus obtained showed the percentage of the total language frequency which occurred with a given activity. This method was carried out for language relationship to physical, constructive, manipulative, and imaginative activity, and to group activity (+) and group activity (—).

To obtain this material it was decided to use Series V, since the degree of reliability between observers for this series was relatively high and since it was possible also to include a small group of younger children. The children were regrouped into three age groups consisting of ten two-year-old, fifteen three-year-old, and eight four-year-old children. The mean age of the youngest group

Table 12

Significance of the Difference Between the Means for Percentage of Language Frequency Occurring With Certain Activities as Compared With That Occurring With Other Activities for Two-, Three-, and Four-Year-Old Children

Occurrence of Language With Other Activities	Mean Age								
	2 years, 6 months, 0 days			3 years, 6 months, 0 days			4 years, 2 months, 0 days		
	Frequency Per Cent	t	P when n = 18	Frequency Per Cent	t	P when n = 28	Frequency Per Cent	t	P when n = 14
Physical	46	5.56	.01	41	4.69	.01	44	4.39	.01
Constructive	11			18			13		
Physical	46	4.92	.01	41	7.11	.01			
Manipulative	15			9					
Physical	46	4.49	.01	41	1.16	.3			
Imaginative	15			34					
Imaginative				34	3.20	.01	42	4.67	.01
Constructive				18			13		
Constructive				18	3.00	.01	13	1.08	.3
Manipulative				9			8		

was two years, six months, of the three year group, three years, six months, and of the oldest group, four years, two months.

The percentages of total language frequency which occurred with each of the play activities in each age group are shown in Table 12. It will be noted that the percentages for none of the age groups total 100. One reason for this discrepancy has already been given. Another, which operated in the two year group, is the fact that they occasionally talked when they were watching others and were not definitely engaged in any one of the four activities under consideration. Fisher's formula was applied to the data above to see whether the apparent differences between averages were real. For the two year group it was found that the highest percentage of talking occurred when the children were engaged in physical activity. In other words, nearly half of the total language frequency for this group occurred with physical activity. There was no real difference between the means of the other three scores. In the three year group, no real difference was found between the score for physical activity and that for imaginative activity, but each of these scores was found to be significantly higher than those for constructive and manipulative activity. The greatest amount of speech, then, occurred when the children were engaged in physical or imaginative play. This statement holds true also for the four year group.

In studying these results it became apparent that talking and large muscular activity did not go hand in hand. This appeared to be true due to the fact that the children were more frequently engaged in this activity and opportunities for speech during this type of play were increased over those for other types of play. It became necessary, therefore, to determine in what percentage of each activity language was observed. This was done by dividing the number of concurrences by the score for each activity. The average percentages of each activity in which language occurred for each age group are shown in Table 13. On inspection, it seems likely that there are differences both in the youngest and oldest groups. But when Fisher's formula is applied to the means, the apparent differences do not stand. In the two year group no real differences are demonstrated between the means for the activities, although there is a possibility that a higher percentage of the time devoted to physical activity was also devoted to language than in the case of manipulative activity. In the three year group there

Table 13

Significance of the Difference Between the Means of Percentages of Certain Activities in Which Children Talked for Two-, Three-, and Four-Year-Old Children

Occurrence of Language With Other Activities	Mean Age								
	2 years, 6 months, 0 days			3 years, 6 months, 0 days			4 years, 2 months, 0 days		
	Frequency Per Cent	t	P when n = 18	Frequency Per Cent	t	P when n = 28	Frequency Per Cent	t	P when n = 14
Physical Constructive	49 36	.63	.5	59 55	.51	.6	77 54	1.64	.1
Physical Manipulative	49 36	1.31	.2	59 62	.37	.7			
Physical Imaginative	49 55	.48	.6	59 69	1.43	.2			
Imaginative Constructive				69 55	1.24	.2	75 54	1.20	.3
Imaginative Manipulative	55 36	.49	.6						
Manipulative Constructive							73 54	1.15	.3

is again an indication that children talked a greater portion of the time while engaged in imaginative activity than in physical or constructive activity. In the older group no significant differences were obtained, but there is a general trend toward less speech when engaged in constructive activity.

From these results, then, one is justified in concluding that in the case of this small group of children there is reason to believe that the highest language frequency occurred with physical activity in the two year group and with physical and imaginative activity in the three and four year groups. This is true in part because of the amount of time spent in each activity. In other words, if an equal amount of time had been spent in each activity, there might not have been differences in language frequency. However, there is some indication that speech and construction are not so likely to occur concurrently as speech and other activities.

Relationship Between Language Frequency and Group Play

It will be remembered from the definitions that group play was considered in both its positive and negative aspects. To make this section somewhat clearer, the definition used is repeated here:

> Such activities as participating in group play, showing by overt, expressive behavior that he is affected by the group, were included here: Tumbling, running, jumping, or laughing with another child, repeating the action more than once; waiting at the bottom of the slide for others, talking or laughing with them; racing with others in house play; including others in house play; constructing with others, discussing project, or handling of materials; playing games such as, "Ring Around a Rosey."
>
> The negative aspect includes: Playing alone, physically apart from other children. If space or material do not permit him to play at any distance, nevertheless, by his lack of overt social reactions, it is clear that his play is independent of those about him.

To determine the relationship between language frequency and group play, the same method of computation was used as for the language activity section. The following tabulation shows the concurrence of language frequency with the positive and negative aspects of group play, and the significance of the difference between the means in each age group:

Mean Age				Per Cent of Language			
Years	Months	Days	Children	Group Play (+)	Group Play (—)	t	P
2	6	0	18	55	51	.714	.50
3	6	0	28	63	45	1.630	.10
4	2	0	14	73	29	4.630	.01

No significant difference is apparent between the percentage of language frequency in a group and alone for two-year-olds, a definite trend in the three year group, and a real difference in the four year group.

Again it seemed necessary to look at the data from the point of view of the percentage of plus and minus group activities in which children talked. This material is summarized:

Mean Age				Occurrence of Language			
Years	Months	Days	Children	Group Play (+)	Group Play (—)	t	P
2	6	0	18	53	44	.95	.40
3	6	0	28	70	53	2.23	.05
4	2	0	14	83	62	3.62	.01

It was found that when Fisher's formula was applied to the means, a significant difference was obtained in the case of both three-year-old and four-year-old children. In other words, the three- and four-year-old children studied talked a greater percentage of the time when playing in a group than when not playing in a group. In the two year group, however, relatively as high a percentage of minus group play as plus group play was characterized by speech. These two-year-old children were observed to talk as much when not in a group as in a group.

Relationship Between Group Play and Each Play Activity

From an educational point of view it was of interest to know whether any given activity was more conducive to the stimulation of group play than another. Accordingly percentages were worked out to show (1) the concurrence of group play and each type of

activity, and (2) the percentages of each activity in which the children played in a group. The summaries are shown at this point:

Activity in Which Child Played	Children	Frequency Per Cent	t	P
		Mean Age		
		2 Years, 6 Months, 0 Days		
Physical Imaginative	18	45 14	6.50	.01
Physical Manipulative	18	45 21	4.89	.01
Physical Constructive	18	45 17	4.67	.01
		3 Years, 6 Months, 0 Days		
Physical Constructive	28	46 19	3.25	.01
Physical Imaginative	28	46 32	.44	.70
Imaginative Constructive	28	32 19	1.62	.10
Imaginative Manipulative	28	32 7	3.57	.01
		4 Years, 2 Months, 0 Days		
Physical Constructive	14	44 14	4.28	.01
Constructive Manipulative	14	14 4	1.42	.20

This material indicates that more group play occurred in physical activity than in any other in the two year group, and in physical and imaginative activity in the three and four year groups. This is verified when Fisher's formula is applied to the means. The results show that the concurrence of group play with physical activity is greatest for two-year-olds. In the three year group no significant difference is shown between the means for group play concurrent with physical and with imaginative play, but a real

difference is demonstrated between these two and the other two activities. The same facts hold for the four year group.

The percentages of each activity in which children played in a group are summarized as follows:

Activity in Which Child Played	Children	Frequency Per Cent	t	P
	Mean Age 2 Years, 6 Months, 0 Days			
Imaginative	18	57	1.13	.3
Manipulative		44		
	3 Years, 6 Months, 0 Days			
Imaginative	28	62	.82	.4
Manipulative		48		
	4 Years, 2 Months, 0 Days			
Imaginative	14	77	1.50	.2
Constructive		53		

The means were studied to see whether significant differences were obtained between them. From the data it is not possible to say definitely, even for this small group of children, whether inclination to play in a group can be fostered more successfully by one type of activity than another. It is possible that imaginative activity lends itself to speech and to group play more readily than some others, but certainly there is not conclusive evidence to that effect.

One fact which is evident, from the data in the entire section dealing with relationships, is that children may engage oftener in one activity than another, thus raising the percentage of language frequency and group play concurrent with it. This may easily mislead the observer into drawing erroneous conclusions.

SUMMARY AND CONCLUSIONS

The study was undertaken in an attempt to evaluate, after subjection to careful control and analysis, the so-called observational approach to the study of child behavior. From the resulting records the writers wished to make some contribution to the questions of (1) age differences in the choice of play activities, (2) sex differences in choice of play activities, (3) growth or changing interest in play activities, (4) the relationship between use of language and

types of play, and (5) the relationship between group play and types of play activities.

The subjects were thirty-five two- and three-year-old children in attendance at the preschool laboratories of the Iowa Child Welfare Research Station. Each child was observed for twenty minutes in the forenoon every four days from October through May by one of two trained observers. A record was made in tabulated form on a sheet carrying twenty-seven items of behavior. Additional information was jotted down in the form of running notes.

The following conclusions were drawn:

1. The observers were able to record, working simultaneously but separately, and to agree substantially on but fifteen of the twenty-seven items listed in the blank.

2. Agreements on the five items having the highest frequency yielded coefficients of correlation ranging from .73 to .97. Percentage agreements on the other ten items ranged from .72 to 1.00.

3. Eight items of the fifteen had a sufficiently normal distribution to warrant further analysis. These eight items then formed the basis for answering the questions involved in the second aim of the study.

4. Real differences were found between the two- and three-year-old children in language frequency, imaginative play, group play, manipulative play, and watching others. The older children had the higher scores for the first three items and lower scores for the last two.

5. In the choice of play activities, sex differences were found in physical play only, the boys having the higher score.

6. Both age groups made a real increase in scores from October 1 to May 1 in language frequency, constructive activity, imaginative play, group play, and playing alone. A decrease in score was noted for watching others.

7. When time corrections were made it was found that speech occurred with approximately equal frequency in physical, manipulative, and imaginative play but less frequently in constructive activity.

8. The two-year-old children in the group talked as much when playing alone as when playing with others. The three- and four-year-old children talked definitely more when playing in a group. These statements held also when corrections were made for time.

(This part of the study was carried on near the end of the year when it was possible to have three age groups.)

9. There was no conclusive evidence that group play occurred more frequently with one type of activity than with any other, after corrections were made for time.

The study warrants the general conclusion that the observational approach to the study of child behavior will yield highly reliable results if the observational plan is concise and sufficiently limited in scope and the observers are well trained. The ability to differentiate individuals and groups by the use of this method will depend on how well these conditions are met and also on the nature of the information sought, since it is possible that some types of behavior are so subtle as to defy objective description at the present time.

REFERENCES

1. Arrington, Ruth E.: Interrelations in the behavior of young children. Teach. Coll., Columbia Univ., Child Develop. Monog., 1932, No. 8, Pp. xx, 156.
2. Barker, Margaret: A technique for studying the social material activities of young children. Teach. Coll., Columbia Univ., Child Develop. Monog., 1930, No. 3, Pp. 69.
3. Beaver, Alma Perry: The initiation of social contacts by preschool children: A study of technique in recording social behavior. Teach. Coll., Columbia Univ., Child Develop. Monog., 1932, No. 7, Pp. 65.
4. Berne, Esther Van Cleave: An experimental investigation of social behavior patterns in young children. Univ. Iowa Stud., Stud. in Child Welfare, 1930, 4, No. 3, Pp. 93.
5. Goodenough, Florence L.: Measuring behavior traits by means of repeated short samples. J. Juvenile Res., 1928, 12, 230-235.
6. Hulson, Eva Leah: An analysis of the free play of ten four-year-old children through consecutive observations. J. Juvenile Res., 1930, 14, 188-208.
7. Moore, Elizabeth Skelding: The development of mental health in a group of young children: An analysis of factors in purposeful activity. Univ. Iowa Stud., Stud. in Child Welfare, 1931, 4, No. 6, Pp. 128.
8. Thomas, Dorothy Swaine, and associates: Some new techniques for studying social behavior. Teach. Coll., Columbia Univ., Child Develop. Monog., 1929, No. 1, Pp. x, 203.

PART THREE

THE ADEQUACY OF SAMPLES OF BEHAVIOR OBTAINED DURING SHORT OBSERVATION PERIODS*

by

ESTHER VAN CLEAVE BERNE
AND
HELEN GARSIDE KELLY

* This study was directed by Ralph H. Ojemann.

THE ADEQUACY OF SAMPLES OF BEHAVIOR OBTAINED DURING SHORT OBSERVATION PERIODS

The fact that certain investigators attempting to measure behavior traits through short periods of observation often assume adequacy of sampling or altogether overlook the problem of sampling appears to the writers to be undesirable. In order to investigate and clarify certain aspects of the problem of sampling of behavior of children in a preschool group, the present study was undertaken.

DATA

Subjects and Time of Observation

The observations providing the data for the study were made in a preschool group of twenty-one two- and three-year-old children from November 21, 1927 to January 13, 1928. Each of five children, ranging in age from thirty-one to forty-five months, was observed approximately two hours on five days scattered over the period of seven weeks. A record of about ten hours of social behavior was available for each child. Absences and the intervention of the Christmas vacation prevented observation of each child at regular intervals. One child was observed five times before the vacation; two, four times; one, three times; and one, only two times.

Fourteen of the observational periods extended from nine until eleven o'clock, and eleven from ten until twelve o'clock. Each two-hour period, therefore, included the ten o'clock hour during which occurred most of the routines of the morning and the story-telling and singing directed by an adult. The routines of this period consisted of going to the toilet, washing hands, taking orange juice and sandwiches, and resting. The nine and the eleven o'clock hours were usually given over to free play. The free play was carried on more frequently in the group room than outdoors in the play yard.

Observational Method

Description of Observational Record.—The observer, sitting or

standing in the preschool group room, observed and checked the social behavior of the subject on an observational record. The record had been prepared for collecting data to be used in attempting to estimate the validity of a rating scale of thirty social behavior patterns and of tests of several of the patterns. The patterns included in the observational record had been selected and defined by the observer as a result of two years of observation and analysis of the behavior of preschool children.

The names of the behavior patterns were placed on the left side of the observational record. At the right of the traits, space was arranged in two divisions, each for a record of five minutes of observation of social behavior. Separate spaces were provided for totaling the number of times each different pattern of behavior appeared within the five-minute and the ten-minute periods. Above the space given to the social behavior observations, a place was provided for a record of the occupations of the child.

Method of Recording Behavior Traits.—The following system was used in recording the behavior patterns which are here studied.[1] With the exceptions of interest, coöperation, and the disrespect for property rights of other persons, each occurrence of a given pattern of behavior was tabulated by placing "1" in the space provided for that pattern. Interest in the group also was so tabulated whenever the observer could follow accurately the child's shifts in interest. However, during group singing and story-telling, the observer was frequently unable to record accurately the shifts in interest. At such times, the records of the five-minute periods were encircled. Later, for the study of the reliability of samples of behavior, twenty, the highest score given on the basis of the observer following a child's shifts in interest, was assigned to each of the encircled interest records. Coöperation was recorded by assigning "1" to coöperative behavior lasting thirty seconds or less. For every succeeding thirty seconds of coöperation within the five-minute period another "1" was recorded. Each instance of disrespect for the property rights of other persons was recorded by the placing of a "—1" in the space provided for recording respect for property rights.

[1] For a complete report of the method of recording the social behavior of the children, refer to Berne, Esther Van Cleave: An Experimental Investigation of Social Behavior Patterns in Young Children. Univ. Iowa Stud., Stud. in Child Welfare, 1930, 4, No. 5, Pp. 93. (p. 69-71)

Definitions of Behavior Traits

The definitions used by the observer in assigning specific behavior to the categories considered in this report were as follows:

Obeys: is submissive to authority; submissive to restraint, or command
Disobeys: refuses to submit to restraint or command
Interest in the group: has attention engaged by the group
Coöperates: works or plays with others; works or plays jointly
Sociable: is companionable, conversable; is fond of mingling or talking with others
Kind: is disposed to do good and confer happiness; is benevolent; well-disposed

The Observer

No attempt was made to determine the reliability of the observer's use of the observational record in the classifying and recording of the social behavior of the children. However, it should be recalled that the observer had devised the classification of behavior and the definitions of the behavior patterns. Also, during the two months previous to the collecting of the data of this study, the observer had used the record in observing and recording the behavior of seventeen children in order to determine a satisfactory length of time for the observational period. In addition, the observer's ratings of thirty preschool children on the scale of thirty behavior patterns were rather highly reliable[2] when the ratings of each of two teachers on the same children were criteria. The behavior patterns included in the observational record were defined identically with those composing the rating scale.

ANALYSIS OF DATA

Sampling Problem

With these data available the writers undertook to determine something of the adequacy of samples of behavior obtained during short observation periods with special consideration for the stability of the sample and the distribution of the time of observation, that is, in consecutive or nonconsecutive periods. The amount of data is not sufficient to solve these sampling problems conclusively, but the analysis of the problems may prove valuable.

---

2 Berne, Esther Van Cleave: An Experimental Investigation of the Social Behavior Patterns in Young Children. Univ. Iowa Stud., Stud. in Child Welfare, 1930, 4, No. 3, Pp. 93. (p. 29)

Preliminary Investigation of the Frequency of Five Behavior Traits.—Before attempting to treat the sampling problems the records for the behavior traits were examined with regard to their frequency of occurrence, in order to avoid using traits with too many zero occurrences during a five-minute period in the calculation of the correlation coefficient. The following tabulation shows for each of five behavior traits the mean per cent of five-minute periods of a day that had a record of some occurrence of the trait. Both free play and routine periods were included.

Behavior Trait	Mean Per Cent for Each Day's Observation
Interest in the group	100.0
Sociability	82.6
Coöperation	78.3
Kindness	9.6
Obedience	16.9

Stability of Behavior Traits for Different Periods of Same Length Correlation Method.—Interest in the group, sociability, and coöperation were chosen on account of their frequency of occurrence as the best traits to use for these problems. The stability of the samples of these three behavior traits for short observation periods of varying lengths was tested by finding the correlation coefficient between scores for two periods of the same length on the same day for each child. There were twenty-five paired scores. Since it was believed that the behavior of the children might be considerably modified by the adult conducted routine and story situations, only free play periods were used. The periods were selected at random, with care taken, however, not to have any overlapping. For the ten- and twenty-minute periods one series was consecutive minutes while the other series was, for the ten-minute period, two nonconsecutive five-minute periods and for the twenty-minute period, four nonconsecutive five-minute periods. The correlation coefficients for interest, sociability, and coöperation are as follows:

Period	Interest Group	Sociability	Coöperation
5 minute versus 5 minute	.581	.228	—.037
2 consecutive 5 minute versus 2 nonconsecutive 5 minute	.588	.452	—.119

Period	Interest Group	Sociability	Coöperation
4 consecutive 5 minute versus 4 nonconsecutive 5 minute	.507	.566	—.008

Briefly summarizing the results,

1. Interest scores obtained during five-, ten-, and twenty-minute observation periods showed some stability.
2. Lengthening the period of observation of sociability seemed to increase the stability of the scores, so that there was some agreement between twenty-minute scores.
3. The scores for coöperation showed no stability for any of the three lengths of observation periods.

Comparison of the Reliability of Short Consecutive and Nonconsecutive Observation Periods.—For further study of the stability of the sample and for the comparison of the reliability of consecutive and nonconsecutive periods, the correlations between scores recorded during varying lengths of short observation periods and the score obtained during an hour observation were computed. The score for one hour, not necessarily sixty consecutive minutes, is used as a criterion; it was tentatively assumed that this length of period gives the observer an adequate picture for a given day of those behavior traits which occur frequently. The two sets of correlations, one for the consecutive periods and the other for the nonconsecutive periods, are presented below. There were twenty-four paired scores.

One Hour Period With	Consecutive	Nonconsecutive
	Interest in the Group	
5 minutes	.465 ± .11	
10 minutes	.690 ± .07	.599 ± .10
20 minutes	.692 ± .07*	.681 ± .07
	.861 ± .04**	
	Sociability	
5 minutes	.588 ± .09	
10 minutes	.835 ± .04	.806 ± .05
20 minutes	.814 ± .05	.879 ± .03
	Coöperation	
5 minutes	.499 ± .10	
10 minutes	.529 ± .10	.693 ± .07
20 minutes	.529 ± .10*	.648 ± .08
	.650 ± .08**	

* Sample I
** Sample II

Interest in the group was a trait of frequent occurrence and had fair consistency between scores made at different but comparable lengths of time. Using nonconsecutive instead of consecutive periods did not raise the correlation with the criterion. The slight difference in the correlations for consecutive and nonconsecutive periods with the criterion is not significant.

The sociability scores for the ten- and twenty-minute periods were fairly stable and the correlations with the criterion showed them to be rather representative. The similarity of the correlations for consecutive and nonconsecutive periods gave indications that the use of either might be an equally reliable procedure.

For coöperation, which had no consistency in scores for different observation periods of comparable length, the correlations for the nonconsecutive periods indicate slight improvement over the consecutive.

For the three behavior traits the correlations for the ten- and twenty-minute consecutive periods with the criterion were practically the same. This led to the obtaining of another random sample of twenty consecutive minutes for interest and coöperation. The second sample for interest showed a correlation with the criterion of .861 and coöperation showed a correlation of .650. Comparing with the first sample, both correlations are higher and show considerable fluctuation due to sampling.

To summarize the findings thus far, it seems as if a sample of twenty consecutive minutes of interest gives a fairly representative picture of the child's interest for the day. This conclusion is based on the correlation of two twenty-minute periods (.507) and the correlations with the criterion. (Sample I .692, Sample II .861) Likewise, for sociability a score for a ten- or a twenty-minute consecutive period seems to give some indication of the child's sociability for the day ($r = .835$ and $r = .814$). On account of the instability of coöperation as shown by the correlations between the scores of five-, ten-, and twenty-minute periods with the scores of comparable lengths of time it is in no way suggested that any of these three lengths of time are adequate samples. Many short periods of observation distributed through the day would perhaps be more adequate, although these data give only slight indication in favor of nonconsecutive periods for this trait and no indications for interest or sociability.

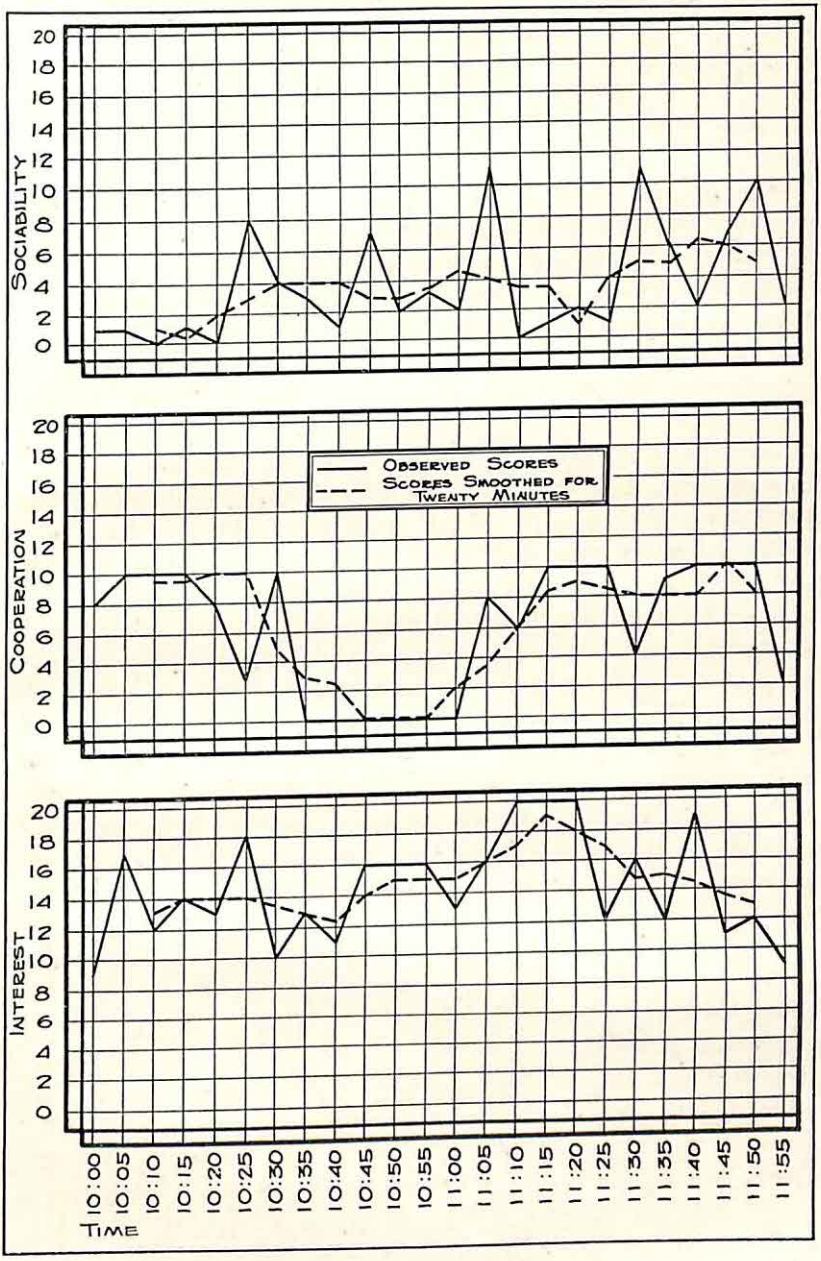

SOCIABILITY
COOPERATION
INTEREST
OBSERVED SCORES
SCORES SMOOTHED FOR TWENTY MINUTES
0
2
4
6
8
10
12
14
16
18
20
10:00
10:05
10:10
10:15
10:20
10:25
10:30
10:35
10:40
10:45
10:50
10:55
11:00
11:05
11:10
11:15
11:20
11:25
11:30
11:35
11:40
11:45
11:50
11:55
TIME

Figure 1.

Stability and Trend of Behavior Traits Shown by Observations for a Long Continuous Period.—At this point it was thought that curves of the scores for each five-minute period of the continuous two hours observation for each day for several children would show more specifically the stability or instability of the traits as indicated by the correlations.

The scores for the five-day observations for each of four children were plotted. In studying these curves, first, the characteristics of the curves of each of the three behavior traits which seemed to be common for each child were noted, and second, by the method of the moving average it was determined for several curves how well irregularities in scores smoothed out in ten- and twenty-minute periods.

Comparing the curves of the three traits the curve of coöperation differs the most markedly from the other two. (Figures 1 and 2) This curve showed periods of several consecutive values at both extremes of the scale and few intermediate values. Neither interest nor sociability showed many periods of consecutive extreme values; both curves presented a rather zigzag appearance. In looking at the curves one would anticipate considerable difficulty in trying to find a short period in which irregularities would smooth out in the curve for coöperation. On the other hand, it seemed as if interest and sociability with more frequent fluctuations around intermediate values might smooth out more readily.

The curves for six-day measurements for four children were smoothed by a moving average[3] for ten and twenty minutes. The smoothing by twenty minutes gave more regular results than by the ten minutes. The results for the twenty-minute smoothing are given below. In the case of each of the behavior traits the number of smoothed values which fell within one-fifth of the range of the total scoring scale are given.

The smoothed values showed that the chances of obtaining a representative sample of a given day's interest in twenty minutes are better than 2 to 1; for sociability about 2 to 1; and for coöperation less than 2 to 1.

These data also indicate that the samples of behavior for differ-

[3] This method of analysis is frequently used in economic statistics in the study of fluctuations and trends of time series. Mills, Frederick Cecil: Statistical Methods Applied to Economics and Business. New York: Henry Holt, [c. 1924] Pp. xvi, 604. (p. 252-343)

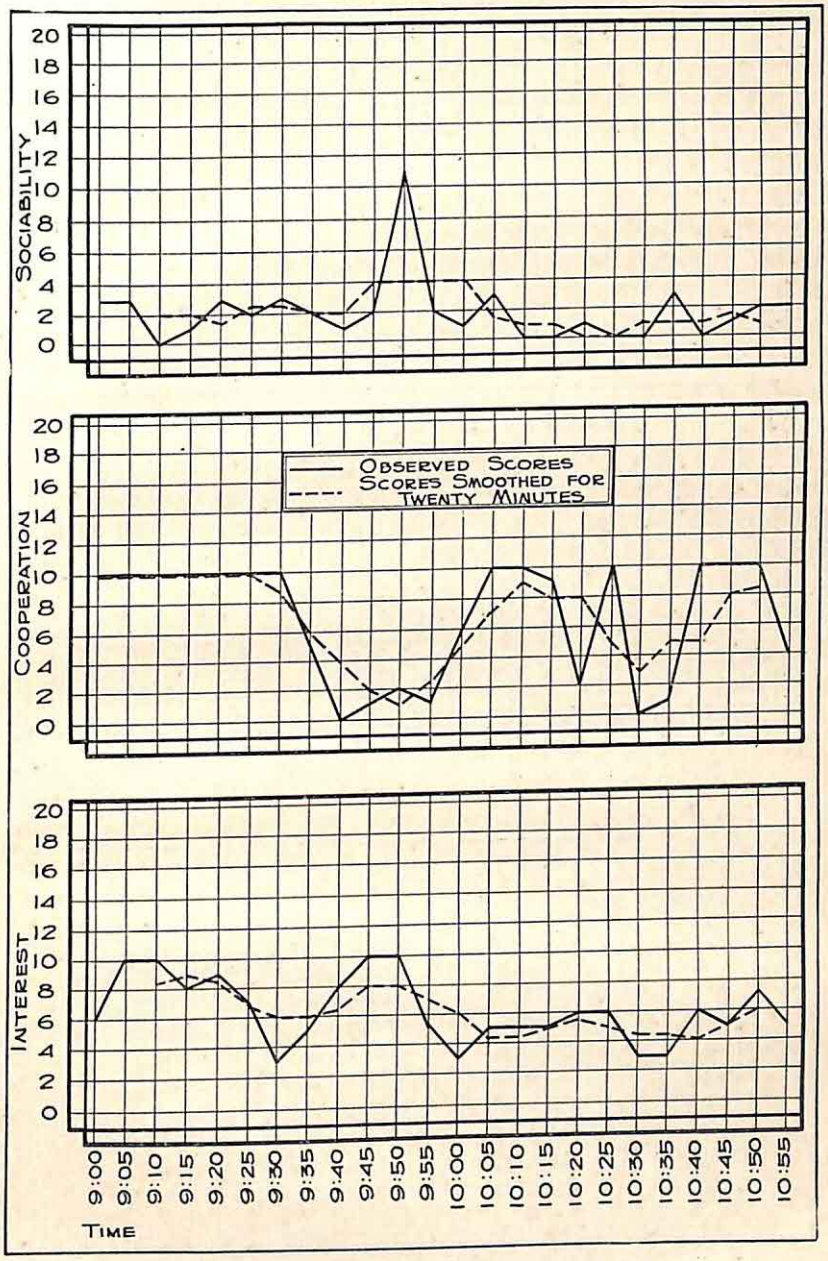

SOCIABILITY
COOPERATION
OBSERVED SCORES
SCORES SMOOTHED FOR TWENTY MINUTES
INTEREST
0
2
4
6
8
10
12
14
16
18
20
9:00
9:05
9:10
9:15
9:20
9:25
9:30
9:35
9:40
9:45
9:50
9:55
10:00
10:05
10:10
10:15
10:20
10:25
10:30
10:35
10:40
10:45
10:50
10:55
TIME

Figure 2.

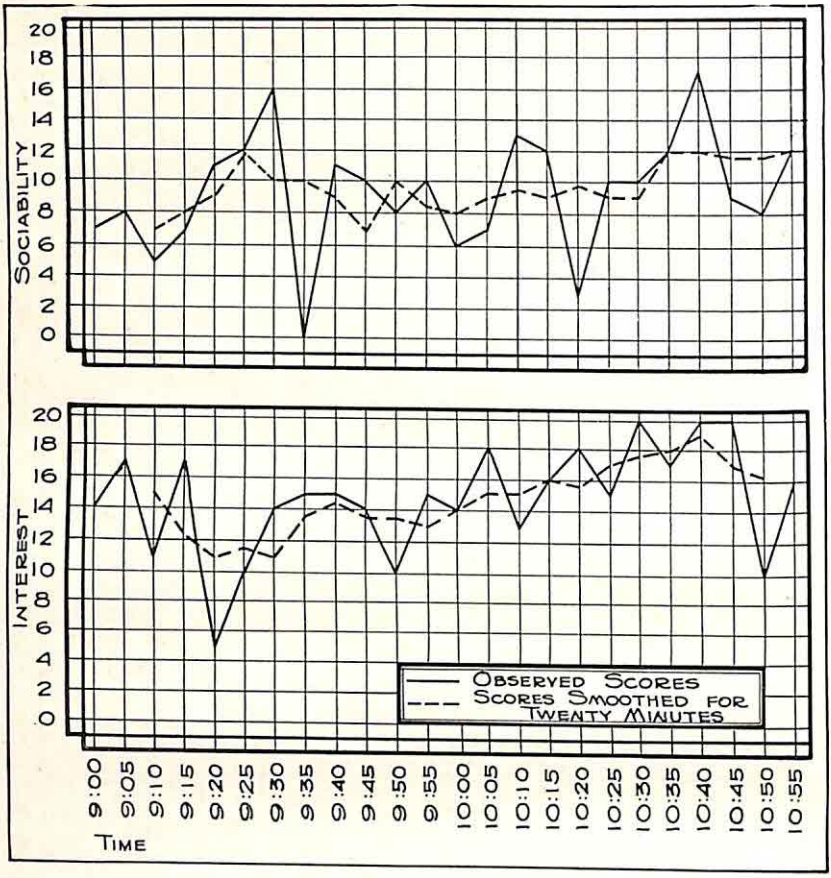


Figure 3.

Child	Interest (Smoothed to Within 4 Scores)	Sociability (Smoothed to Within 2 Scores)	Coöperation (Smoothed to Within 2 Scores)
D.D.	19 of 21	15 of 21	12 of 21
B.A.	20 of 21	17 of 21	10 of 21
B.A.	16 of 21	11 of 21	13 of 21
B.A.	14 of 21	14 of 21	17 of 21
T.M.	15 of 21	14 of 21	14 of 21
M.T.	16 of 21	16 of 21	9 of 21

ent days are not stable. Figures 2 and 3 giving the curves of the same boy on different days illustrate this statement.

CONCLUSION

In conclusion, this study points to the instability of these behavior traits and the necessity of a very careful analysis of the trend of each trait before it can be claimed that a measure is adequate to show individual differences. That is, an analysis of the continuous curve of the behavior trait to discover a short period that gives a score which is fairly constant or representative of a longer period is necessary. This might involve the study of the fluctuations in minutes, hours, days, weeks, months, or longer periods. The adequacy of the sample is limited to the particular group and situation under which it was determined.

PART FOUR

AN EXPERIMENTAL INVESTIGATION OF CERTAIN FACTORS INVOLVED IN THE PRESCHOOL CHILD'S COMPLIANCE WITH COMMANDS*

by

LaBerta A. Weiss

* This study was directed by Dr. Esther Van Cleave Berne.

AN EXPERIMENTAL INVESTIGATION OF CERTAIN FACTORS INVOLVED IN THE PRESCHOOL CHILD'S COMPLIANCE WITH COMMANDS

The present investigation was undertaken for the purpose of analyzing more completely certain factors involved in the preschool child's compliance with commands. The specific objectives were: (1) to determine the relation of toy, social, and control situations to length of time required and types of behavior evidenced in the preschool child's compliance with commands; (2) to determine the effect of complexity of commands on compliance; and (3) to ascertain mental age and sex differences in the fulfillment of commands.

It should be noted that this investigation does not represent an attempt to set up a scale for measuring obedience. The aim of the study is rather to make a preliminary analysis which may be of significance in setting up the limits within which the child's obedience may be expected.

Even from the viewpoint that all obedience must be for the child's own good, there remain two situations in which obedience is necessary: (1) compliance with habits which must be learned, even before comprehension of the significance of such behavior as habits of eating, sleeping, and elimination; and (2) emergency situations in which immediate and unquestioning obedience may mean the difference between life and death.

The test items used in this study have been considered commands, since the subjects were not expected to have a preference in complying with them. For the sake of convenience the term "test" has often been used in referring to the eight commands as a unit. The term "task" refers to the activity involved in fulfillment of a given command.

PROCEDURE OF EXPERIMENT

The experiment used in the present study consisted of giving eight commands to seventy-seven[1] children from two years, five

[1] The two two-year-old children were not included in the analysis of data because of the small number of cases in this group.

months to five years, eight months of age, enrolled in the preschool laboratories of the Iowa Child Welfare Research Station. The commands were given under three experimentally controlled conditions designated as (1) the control, (2) the toy, and (3) the social. Each subject was given the same eight commands in each of the three experimental situations. Time and observational records were secured. These three situations involved the same eight commands by the same experimenter in the same experimental room. In the control situation the subject was furnished no materials with which he might occupy himself between commands. In the toy situation there was a variety of toys with which the subject was encouraged to play. In the social situation a companion of the child's own age was present in addition to the toys used in the toy situation.

The rooms in which the experiments were conducted were fairly comparable in size and exposure for each of the preschool groups. A rag carpet was spread along the south wall, with a pillow for the child to sit on and a second pillow for the social situation. The experimenter sat at a table along the west wall.[2] All three experiments used the same equipment except that toys were added for the toy situation, and toys and a second pillow were used in the social situation.

Selection of Test Items

The test items were selected with care that they should not produce unpleasant emotional reactions nor strongly motivate the subjects. The commands also were carefully planned so as not to unduly arouse the child. A preliminary test was presented to eight children, two from each of the four preschool groups, as a basis for the final shaping of test details. The results were not evaluated or combined with later findings, nor were the children used as subjects in the main experiment although they were used as companions in the social situation.

[2] Other articles used in the experiment were a chair on which the test articles were to be placed, the basket in the southeast corner of the room, the picture used in the eighth command, the hood used in command 2, and toys for the toy situation. The toys were arranged in the center of the rug so that they would not obstruct the subject's path when he rose to carry out a command, and included a doll with composition head and arms, a rag doll, one red and one blue aeroplane, one green truck, one aeroplane picture book, one farm scene book, one Mother Goose picture book, twenty-four unpainted wooden blocks, and two wooden dolls.

A description of the test items as used in the main experiment is given below:

1. ———— (name of child), put the ball which is under the table in the basket.

   The command was such that the subject had to walk around the edge of the table to the opposite side, and then get down on his knees for the ball. It involved, therefore, a fair degree of motor control and, though a simple command which could be performed in relatively cramped quarters, took long enough that differences in the time taken by various subjects could be easily noted.

2. ————, hang the coat and the cap on the hook.

   This is a motor task with which all the preschool children were familiar. It served, with command 1, to supply data on compliance with simple commands. The coat and cap were placed across the free end of the table.

3. ————, put the blocks which are on the chair in the box on the table, and then bring the box to me.

   This is a unified command involving three distinct actions. It was intended for comparison with a three-part command involving the same actions but less unified in nature. It was hoped that the comparisons would give some indication of whether the preschool child would be able to grasp or perform more efficiently complex commands which are unified wholes than commands of similar complexity (from the standpoint of performance) which are not so unified.

4. ————, bring me the key that is under your pillow.

   The command is similar in nature to the first one given. This one, however, probably required more imagination than did the first command for, in order to comprehend and successfully fulfill it, the subject had to deal with an object not directly visible.

5. ————, put the paper and the sack in the basket.

   This is a two-part command, more complicated than the simplest command for this reason. The paper was a folded weekly news sheet and the sack was a paper one, half inflated.

6. ————, put the handkerchief, which is on the floor, on the chair; put the book, which is on the chair, on the table; and bring me the pencil from the table.

   This command was the one to be compared with item 3 for an indication of the influence which unity of the idea involved in the command might have on the child's ability to comprehend and remember.

7. ————, put the scissors which are by the basket on the table.

   The item falls in the same category as do commands 1 and 2 and can be used with them to supply further data on compliance with simple commands.

8. ————, give me the picture which is hanging on the wall.

   The picture was placed so high that no child could reach it even with the aid of the experimental chair. How rapidly could children

at the different age levels recognize the impossibility of such a situation, and what type of response would the situation call forth?

Collecting Data on Main Experimental Group

Only one experimenter tested the two-, three-, and four-year-old groups. The subjects were divided into three equal groups to equalize the effect of the order of presentation of the three situations which were presented in varying order. Each test period ranged from five to twenty minutes in length, the social and toy situations taking much longer than the control. The experimenter waited until the subject seemed to have resumed the same direction of attention to his own activities that he had displayed before the command had been given. Each command was given slowly and distinctly.

Recording Test Data

The experimenter kept two types of record on each experimental situation: (1) time records of the child's response and (2) detailed notes on such aspects of behavior as verbal remarks, substitute activity, and forgetting.

Two types of time records were secured—preresponse time and response time. Preresponse time is a term used to indicate the interval of time elapsing between the beginning of the command and the subject's initial response. By initial response, the experimenter meant that the child had placed one foot flat against the floor or had placed one knee in that position. It was found unreliable to take any movement prior to these two as an indication of response. Response time is a term used to designate the interval elapsing between the initial response and the fulfilling of the command. Record was made of the two types of response by means of a split-timer stop-watch in order to be able to read simultaneously both the preresponse and the response records.

Time data were recorded in the first three columns of the blank. Time for initial response of a verbal nature, preresponse time, and response time were recorded.

A record was kept of the subject's behavior during response. Details of behavior and verbal responses during the experimental period were also recorded. On the back of the record sheet the experimenter kept a detailed account of the toys with which the subject had played and with which he was playing when a command was given.

RELIABILITY OF TESTS

Establishing the Reliability of the Test

Testing for reliability was begun with twenty-five five-year-old children since this group was twice as large as any of the others and since the results for it were not expected to be so important as those for the earlier ages. The group was separately tested by the two experimenters, one beginning with the morning group and the other with the afternoon group. These were further divided into three groups, each of the three receiving the three test situations in a different order.

Two measures of reliability were obtained: (1) reliability of time scores and (2) the experimenter's reliability in classifying behavior.

Reliability Coefficients.—Correlations obtained between experimenters for data received on the same subjects and same situations but at different periods are presented in the following tabulation:

Situation	Children	Raw r	Raw t	Corrected r	Corrected t
		Preresponse			
Control	24	.53	2.914	.59	3.404
Toy	23	.52	2.810	.46	2.399
Social	24	.57	3.240	.64	3.902
		Response			
Control	24	.86	7.923	.65	
Toy	24	.53	2.890	.48	
Social	21	.87	8.163	.29	

The coefficients range from .52 for preresponse time in the toy situation to .87 for response time in the social situation, most of them ranging between .50 and .60.[3] It will be seen from the above tabulation that all correlations obtained were statistically reliable with the possible exception of the one based on twenty-three cases.

Reliability of single items was checked by determining the cor-

Command	Item	Cases	r	t
7	Simple	24	.30	1.413
3	Compound	24	.23	1.073
5	Compound	24	.51	2.650
6	Complex	24	.41	2.012

[3] The significance of the above correlations was determined by the method outlined by Fisher (2).

relation between the results of the two experimenters on simple, compound, and complex requests. The specific items used and the results obtained are listed above. All are much lower than were coefficients for the entire test.

The correlations obtained for the test as a whole are fairly high if the various factors making for lessened reliability in the above samples are considered. Among the factors making for a low coefficient may be mentioned the following: (1) the small number of cases, (2) the small range of talent, (3) a consistent practice effect between the first and second giving of each situation, and (4) individual variations on the part of the subject from one period to the next noticeable because experimenters did not make simultaneous records of test responses. The one attempt made to reduce the above factors had to do with elimination of practice effects. However, the results did not justify similar treatment of the response-time data.

Mean Differences.—Since the preresponse and response time data were to be considered largely in terms of group means and the significance of the differences between those means, it seemed wise to make the same type of comparison between the data secured by the two experimenters. The results of this treatment are presented in the tabulation below:

Situation	Experimenter W		Experimenter J		Ratio
	Mean	P.E.	Mean	P.E.	
		Preresponse			
Control	4.61	.46	4.43	.67	1.06
Toy	5.56	.63	5.46	.69	0.53
Social	5.48	1.01	5.34	1.44	0.39
		Response			
Control	10.00	.36	9.46	.32	1.12
Toy	11.33	.45	9.92	.30	2.74
Social	13.56	.47	12.45	.47	1.78

It will be seen that actual preresponse time ranged from .18 to .10 seconds. None of the ratios even approached the value of 4 (Garrett (3)), a proof that disagreements between the two experimenters for the group as a whole were not at all significant.

Percentage Agreement on Basis of Trends.—One of the main purposes of the present investigation was to determine the relative relationship of the three types of experimental situations to vari-

ous types of response. Since trends were thus as important as were actual numerical scores, a check was made on reliability of trends between the two experimenters. By "consistency of trends" is meant the finding by Experimenter W and J of the same tendency for one situation to yield a greater or lesser score than the other. The comparisons made were control and toy, toy and social, and control and social. Each individual was scored +1, 0, or —1 for each pair of situations. A plus 1 meant the finding of a higher score on the second named member of the pair; a minus 1, the finding of a higher score on the first named member of the pair; and a zero, an equal score on the two situations.

The scores thus secured by the two experimenters were compared by securing the ratio of total agreements between experimenters to total possible agreements. The results are tabulated below:

Situations	Children	Per Cent	P.E.*
	Preresponse		
Control-Toy	25	87	7
Toy-Social	25	78	8.6
Control-Social	25	91	5.1
	Response		
Control-Toy	25	70	6.9
Toy-Social	25	65	7.2
Control-Social	25	84	5.7

* Rietz (5)

It is interesting to note that the trend of percentages is similar for both time records, that is, the second comparison gives the lowest percentage correct, the first comparison ranks next, and the control-social comparison ranks highest. All percentages are statistically significant as an examination of their probable errors indicates.

Reliability in Classifying Behavior Items.—In order to determine the experimenter's reliability in classifying the behavior recorded, the blanks of ten individuals in each of the three age levels were selected by random choice. A second experimenter reclassified behavior items contained in these thirty blanks which represented the data on control, toy, and social situations for each subject. A total of 666 items of response were contained in the thirty blanks.

The assistant who reclassified behavior items was the same person who assisted with the preceding reliability testing. She was given the list of behavior items with definitions for the least clear-

cut ones. The assistant checked each time a certain behavior item occurred, noting the age level in which the subject was found and the situation in which the activity appeared. Percentages were determined by dividing the number of consistent items of a given behavior by the highest number of times that behavior was found manifested on the thirty blanks. The total percentage of consistency (throwing together all types of behavior) was .95 ± .0054.

ANALYSIS OF DATA

The test data have been treated in two divisions: (1) those dealing with response in terms of time, and (2) those dealing with specific types of behavior patterns (forgetting, substitution, play with test equipment, etc.).

Time Differences

The following tabulation shows the mean time taken and the probable errors for a simple, a compound, and two complex commands. It is of interest for comparing the length of the command with the length of the preresponse period. The tabulation reveals

Command	Item	Cases	Preresponse	Probable Error of Mean
7	Simple	97	6.75	.30
5	Compound	98	9.50	.43
3	Complex	98	10.50	.52
6	Complex	100	13.00	.45

Command	Ratio
7 and 5	5.19
5 and 3	1.47
3 and 6	3.62
7 and 3	6.43
7 and 6	11.79
5 and 6	5.64

a consistent tendency toward increased preresponse time with increased complexity of the command. Four of the six differences are statistically significant.

Time differences have been analyzed in relation to chronological age, mental age, IQ, sex, types of toys played with, and complexity of commands.

Comparisons of Age Groups.—A comparison of age groups reveals a consistent decrease in time taken for response in each of

the three situations as the groups increase in age. The difference is consistent in both the preresponse and the response time means. It also appears remarkably constant, with about two seconds difference in preresponse time between any two successive groups on any one situation.

Age, Years	Children	Control		Toy		Social	
		Mean	P.E.	Mean	P.E.	Mean	P.E.
				Preresponse			
3	16	8.0	.41	12.5	.73	11.0	.66
4	15	6.5	.29	10.5	.68	9.0	.73
5	26	5.0	.34	7.5	.42	7.0	.25
Total	57	6.0	.20	10.0	.33	9.0	.25
				Response			
3	16	21.0	.94	27.0	1.28	29.0	2.01
4	15	14.0	.80	19.0	1.02	15.0	.95
5	26	10.0	.35	13.5	.49	15.0	.62
Total	57	13.5	.66	20.5	1.04	16.5	1.25

An examination of the above tabulation shows that preresponse time was longer for the toy than for the social situation at all age levels, and longer for the social situation than for the control. The difference between toy and social situations amounted to 1.5 seconds for the three- and four-year-old subjects and to 0.5 seconds for the five-year-olds. The mean difference between the social and control situations was 2.5 seconds. Response time means do not reveal such consistent trends, the only one being the shorter time interval for the control than for the other periods. Variability was greater in fulfilling than in first responding to the command.

According to this tabulation the five-year-old group showed not only less difference between the means of the toy and social situations, but also a smaller difference between the control-toy and the control-social situations than the other age groups. The five-year-old group would seem to subjugate its interests to the task more readily than did the other age groups. Six of the eighteen preresponse and the response time differences between situations were significant, and five others practically so.

One of the greatest factors contributing to the large probable errors of the above data was undoubtedly the difficulty of eliminating delays due to indirect types of response, such as verbal excuses or wandering attention. Since the aim of the present study was to analyze the factors making for differences in response rather

than to determine the exact effect of any particular factor, it was not possible or advisable to control this.

Table 1
Mean Preresponse and Response Times According to Mental Age Groups in Each of the Experimental Situations

Mental Age, Months	Children	Test Situation					
		Control		Toy		Social	
		Mean	P.E.	Mean	P.E.	Mean	P.E.
Preresponse							
78 and above	4	16.0	6.41	6.0	.31	6.0	.30
66 to 78	17	5.5	.17	8.5	.54	7.0	.31
54 to 66	12	6.0	.27	9.0	.45	9.5	.47
42 to 54	15	7.5	.40	12.5	.59	11.5	.45
30 to 42	5	9.0	.97	9.5	1.13	12.0	1.25
18 to 30	2	10.0	.79	11.5	2.04	18.0	.96
Response							
78 and above	4	11.0	.64	10.0	.39	13.5	.75
66 to 78	17	10.5	.22	14.5	.66	14.0	.58
54 to 66	12	13.5	.93	16.0	.93	16.5	1.08
42 to 54	15	17.0	1.10	21.0	.46	25.0	2.09
30 to 42	5	18.0	1.26	25.5	1.51	34.0	6.45
18 to 30	2	70.0	12.31	28.0	2.91	25.0	6.46

Comparison of Mental Age Groups.—From a mental age of seventy-eight months to one of thirty or below there is a consistent trend toward increased preresponse time with decrease in mental age in the control and social situations (Table 1). The trend is also consistent for the toy situations (with an exception of the thirty to forty-two month level), and in all three situations for mean response time (with one exception in the social situation at the thirty to eighteen month level). The range is 10.5 to 70 seconds for the control period, 14.5 to 28 seconds for the toy period, and 14 to 34 seconds for the social period.

The ratios of differences between mental age groups in the three experimental situations is given below:

Mental Age Groups, Months	Control	Toy	Social
	Preresponse		
66 to 78 and 54 to 66	1.56	0.71	4.39
54 to 66 and 42 to 54	3.13	4.72	3.08
42 to 54 and 30 to 42	1.42	2.34	0.38
66 to 78 and 42 to 54	4.54	5.00	8.18
66 to 78 and 30 to 42	3.54	0.80	3.88
54 to 66 and 30 to 42	3.00	0.41	1.88
	Response		
66 to 78 and 54 to 66	3.16	1.32	2.05
54 to 66 and 42 to 54	2.43	4.85	3.62
42 to 54 and 30 to 42	0.60	2.85	1.33
66 to 78 and 42 to 54	5.80	8.02	5.09
66 to 78 and 30 to 42	5.86	5.46	3.10
54 to 66 and 30 to 42	2.88	5.37	2.68

Although individual variations within groups were large, twelve of the thirty-six differences computed between groups were significant and almost as many approached significance.

Comparison of the IQ Groups.—For purposes of comparison the subjects were divided into five groups on the basis of IQ. Means and their probable errors were determined separately for each of the three experimental situations (Table 2).

An interesting observation of Table 2 is that the least and the most intelligent groups had the longest mean preresponse and response time in each situation. Everyday observation would expect the former to be slowest. That the most intelligent may also take longer to respond than the average or slightly above average group is not so generally accepted, although it is in keeping with the questionnaire findings of Bohannon (1) which showed that the most superior children intellectually were often far from being the most obedient. It is possible that further study might reveal a consistent trend in this respect from the average group through the above average, superior, and very superior groups.

Comparison of Sexes.—The boys were somewhat slower in starting to respond in the toy and social situations than were the girls. This may suggest that boys tend to place their own interests first more than do members of the opposite sex. Boys were also speedier in completing tasks and more variable in their responses. However, individual variations were so large that differences between the sexes have no statistical significance.

Table 2

Mean Preresponse and Response Times According to IQ Groups in the Three Experimental Situations

IQ Group	Children	Test Situation					
		Control		Toy		Social	
		Mean	P.E.	Mean	P.E.	Mean	P.E.
Preresponse							
90 and below	5	7.0	.63	13.5	1.72	10.0	.67
90 to 110	11	6.0	.42	8.0	.86	9.0	.98
110 to 120	10	6.5	.46	9.5	1.01	8.5	.49
120 to 140	27	7.0	.42	9.5	.53	8.0	.55
140 and above	7	7.5	.43	11.0	1.08	12.0	1.89
Response							
90 and below	5	14.5	1.81	21.0	1.84	20.5	2.36
90 to 110	11	10.9	.79	18.7	2.02	16.3	.89
110 to 120	10	12.0	.65	15.5	1.01	16.0	1.40
120 to 140	27	13.0	.53	17.0	.84	16.0	.64
140 and above	7	19.5	1.89	22.5	2.46	26.5	3.32

Test Situation	25 Girls		32 Boys	
	Mean	P.E.	Mean	P.E.
Preresponse				
Control	6.5	.24	6.5	.25
Toy	10.0	.60	11.0	.73
Social	9.0	.44	10.0	.44
Response				
Control	15.5	.69	13.0	.50
Toy	19.5	.83	18.0	.86
Social	19.5	.75	19.0	.70

Preresponse Time Differences as Related to Types of Toys.—Preresponse times of the toy and social situations were checked for each individual, item by item, against the control period. All instances where preresponse time for the former situations was approximately twice as great or greater than that of the control period were marked, and the type of activity in which the child had been engaged at that time was recorded.

The two-year-old subjects played mostly with aeroplanes and picture books, toys calling for activities which are ready planned. (This group is not included in the following tabulation because of

the small number of cases.) Results for the three-, four-, and five-year-olds are considerably more dependable in view of the larger number of subjects studied. A summarized list of the frequency of use of each toy during periods of prolonged preresponse is given in terms of percentages for the three older age groups in the following tabulation:

Toy in Use	Situation					
	Toy			Social		
	Age, Years					
	3	4	5	3	4	5
	Per Cent					
Aeroplane	33	17	17	24	21	16
Aeroplane Book	29	26	9	26	18	8
Mother Goose Book	4	0	6	8	24	0
Farm Book	0	0	3	0	0	0
Blocks	11	36	26	11	3	18
Truck	2	4	11	8	9	2
Wooden Men	13	13	11	13	3	6
Dolls	7	0	17	3	21	10
Watching	0	4	0	8	3	10
Talking	0	0	0	0	0	29
Total Prolonged Periods	45	47	35	38	34	49

The findings for the three-year-old subjects agree substantially with those for the two-year-old subjects. In the toy situation proper, aeroplanes and aeroplane books each had three times the frequency of blocks for prolonged preresponse, and in the social situation the trends are the same. In the four- and five-year-old groups there is a change in the relative frequency of the toys. For the toy situation at both age levels, blocks were the most used in periods of prolonged preresponse. The popularity of the aeroplanes, aeroplane books, and wooden men was not completely lost, however, as they came close after blocks in the list.

The activity of the five-year-old group reveals an increased interest in dolls in both toy and social situations. This was also a frequent occurrence for the four-year-old subjects in the social situation. The types of play occurring with dolls at the different age levels were quite distinct. At the three-year-old level during prolonged preresponse periods the activity was relatively passive, such as holding the doll or manipulating its hands and feet. At the four- and five-year-old levels play with dolls centered around "playing house," "playing doctor or nurse," etc.

The column representing toys used or activities engaged in by

the five-year-old children in the social situation differs markedly from all the rest. In addition to using the play materials, they often engaged in conversation, in general, a discussion or comparison of blocks, aeroplanes, and aeroplane books.

The above method of determining relationships between use of various toys and prolonged preresponse time was chosen because it seemed open to more clear-cut and valid comparisons. The re-

Table 3

Mean Time and Frequency of Occurrence of Toys on Activities In Preresponse Periods, According to Age Groups and Experimental Situations

Activity or Toy	Age, Years					
	3		4		5	
	Situation					
	Toy	Social	Toy	Social	Toy	Social
	Mean Time					
Aeroplane	10.6	12.5	6.7	7.6	8.4	8.3
Picture Book						
Aeroplane	17.7	13.2	15.0	9.0	7.1	7.4
Mother Goose	20.8	9.5	9.7	8.3	8.3	0.0
Farm	8.6	5.8	6.9	16.5	3.5	8.5
Blocks	8.7	7.1	19.3	13.4	7.6	6.0
Dolls	8.9	10.8	8.1	6.6	5.6	7.3
Wooden Doll	14.0	29.3	8.2	0.0	8.2	0.0
Wooden Doll and Aeroplane	16.4	9.4	10.9	0.0	8.0	7.2
Blocks and Truck	21.0	0.0	7.1	19.0	6.8	10.3
Watching	0.0	8.8	0.0	12.4	8.6	7.2
Talking	0.0	9.5	0.0	6.7	5.3	7.6
	Frequency of Occurrence					
Aeroplane	21	16	21	23	17	6
Picture Book						
Aeroplane	26	24	9	12	22	18
Mother Goose	5	9	5	1	20	0
Farm	3	4	2	1	2	1
Blocks	14	15	30	26	46	12
Dolls	8	1	4	5	9	15
Wooden Doll	4	9	14	0	5	1
Blocks and Truck	5	0	10	4	11	2
Watching	0	9	0	10	3	19
Talking	0	14	0	21	3	48

sults were checked by the more detailed procedure of classifying each response according to the toy in use when the response was given, and of averaging the preresponse times for each group. The toy and social situations were treated separately. The data are summarized in Table 3. A comparison of Table 3 with the tabulation on page 141 indicates a high degree of correspondence and tends to substantiate the findings discussed above.

The data singled out for the study of toys and activities in cases of longest preresponse time afford one means of checking the relative influence of the toy and social situations at the various age levels. The percentage of prolonged preresponse times, each percentage being based on the total possible by age groups and situation, is summarized in the following tabulation:

Age, Years	Children	Situation: Toy Per Cent	Toy P.E.	Social Per Cent	Social P.E.	Total	Possible Responses Per Cent	Possible Responses P.E.
3	16	35	3	29	3	71	32	2
4	15	28	3	28	3	58	28	2
5	22	18	2	18	2	55	18	1

The three-year-old subjects took longer to respond in the toy than in the social situation, while the four- and five-year-olds showed an equal amount of prolonged response in each situation. These results are only suggestive of the true differences on account of the slight differences between means and the small number of cases on which the means are based.

Analysis of Types of Behavior Manifested in Response to Commands

The following analysis takes recognition of these factors: (1) verbal responses of the subject, (2) repetition of the command by the experimenter, (3) response before completion of a command, (4) play before response, (5) play during response (including a separate discussion of play with test articles), (6) forgetting during response, (7) substitute activity, (8) attempted or delayed recall, (9) reaction to an impossible command, and (10) manifestation of dislike for the test situation. A separate treatment is also given of complexity of commands as related to some of the above aspects of behavior.

Verbal Responses of Subjects.—Study of initial responses shows two types of verbal response: (1) questions called forth by the statement of the command, and (2) verbal excuses such as an ex-

Table 4
Initial Questioning and Initial Verbal Excuses According to Age Groups and Experimental Situations

Age, Years	Children	Total	Mean	Initial Verbal Response		Test Situation					
						Control		Toy		Social	
				Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error
Initial Questioning											
3	16	37	2.31	60	4	14	4	32	5	54	5
4	15	20	1.33	31	4	5	3	75	7	20	6
5	23	31	1.35	32	4	13	4	48	6	26	5
Initial Verbal Excuses											
3	16	25	1.56	40	4	80	5	84	5	60	7
4	15	45	3.00	69	4	31	5	40	5	29	5
5	23	66	2.87	68	4	26	4	27	4	47	4

pression of desire to continue play or the expression of inability to do the required act.

Table 4 shows a greater occurrence of questioning at the three-year-old level and a greater frequency of excuses at the four and five. Differences between the two types of response for the same age group are statistically reliable for the four- and five-year-old children and approach significance for the three-year-old group. The ratios are:

Age Group, Years	Ratio
3	3.57
4	6.80
5	6.43

In Table 4 there is a striking resemblance between the four- and five-year-old children.

In the hope of securing more insight into age differences in initial verbal response (questions excepted), a classification of the commonest types of verbal response was made for fifty-nine subjects as summarized in the following tabulation:

Response	Age, Years	Situation: Control	Toy	Social	Total	Mean
			Per Cent			
Can't	2	30	60	10	10	5.00
	3	20	20	60	15	0.94
	4	45	17	39	18	1.20
	5	39	33	27	33	1.27
Wait a Minute	2	0	50	50	2	1.00
	3	27	73	0	11	0.69
	4	0	63	38	8	0.53
	5	0	50	50	8	0.31
All Right	2	0	0	0	0	0.00
	3	71	18	12	17	1.06
	4	44	44	11	9	0.60
	5	0	100	0	2	0.08

The percentages given for each experimental situation are based on the total verbal responses occurring in the particular age group concerned.

The two two-year-old children seemed to have more verbal excuses in the form of "can't" and "wait a minute" than any of the other groups. "Can't" as used by the two-year-old subjects probably served largely as an excuse. For the other age groups,

use of "can't" was limited almost exclusively to the eighth command.

"Wait a minute" was used more frequently by the three-year-old subjects than by the three other groups; its use decreased with increase in chronological age. The same relationships exist in the use of "all right."

The height of the questioning tendency in this study seems to be reached at the four-year age level. Inadequate tools of language expression probably account for the fewer questions at the lower age levels, while a greater capacity for comprehension and retention probably makes fewer questions necessary by the five-year-old subjects. Also, this age group may have learned to curb their questions in the preschool group while the three- and four-year-old children are encouraged to be "sociable." In noting the type of question used at the different age levels, the examples indicate a progressive increase in the complexity of questions asked with increase in age.

The percentages of times that a complete repetition of a command was made by the three-, four-, and five-year-old children are 29, 25, and 61 respectively. The five-year-old subjects tended to intersperse their repetitions with original comments and often appeared to repeat instructions because of the sheer joy which vocal activity afforded them.

As might be expected, questionings about the former periods were commoner in the control than in the toy or social situations. The four-year-old children referred to earlier periods slightly more than did the other age groups, which is in keeping with the finding that the four-year-old children were most inquisitive.

Repetition of Commands by the Experimenter.—Repetition as used here refers only to repetition of command by the experimenter when it was not requested by the subject. "Showing" covers repetitions made on special demand of the subject. Twice as much repetition was necessary for the three-year-old subjects as for the other age groups, and almost three times as much "showing." The four- and five-year-old children were remarkably alike in the amount of repetition and the instances of "showing" occurring per individual. The incidence of both repetition and "showing" in the toy situation was greater than in the other two for three- and four-year-old children and greater in the social situation for the five-year-old group.

Response Before Completion of Command.—Many authorities on child training believe that failure to get a command clearly in mind before execution is often the cause of incorrect response. The following tabulation shows the amount of response before completion of a command for separate test items:

Age, Years	Children	Test Item 1	2	3	4	5	6	7	Total
		Per Cent							
3	16	2	6	15	4	0	52	19	47
4	15	13	0	29	13	2	49	18	56
5	22	33	30	44	12	6	56	36	126

Table 5 shows similar data for situation and age groups. This type of response was commonest for the two longest commands (3 and 6) indicating that subjects tend to respond with certain time limits regardless of the completion of the command. Since commands 3 and 6 show also largest number of failures at each age level, hasty response would seem to be closely related to incorrect execution. This may not be a causal relationship, however, since number of things to be remembered may have caused failure, at least in part.

Play Before Response.—Play before response, restricted to play with the toys in the toy and social situations, was recognized if it continued after the command had been given and thus increased the preresponse time. Play before response occurred to a greater extent in the toy than in the social situation, being three times commoner for the three-year-old group.

None of the age groups played a great deal before responding. On the basis of total percentages, the three- and four-year-old children played twice as much as the five-year-old subjects. Ratios of the differences between age groups follow:

Age Group, Years	Ratio
3 and 4	1.00
4 and 5	3.33
3 and 5	3.39

Play During Response.—Two patterns of play during response have been noted: (1) return to play with toys or companion, and (2) play with test articles. In this section both patterns have been treated as one.

Table 5
Percentage of Responses Before Completion of Command and Play During Response According to Age Groups and Experimental Situations

Age, Years	Children	Total	Possible Responses		Test Situation					
					Control		Toy		Social	
			Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error
Responses Before Completion of Command										
3	16	47	14	1	47	5	30	5	23	4
4	15	56	18	1	36	4	28	4	34	4
5	22	126	27	1	38	3	29	2	33	3
Play During Response										
3	16	67	20	2	28	4	28	4	44	4
4	15	37	12	1	19	4	38	5	43	5
5	26	38	7	1	1	1	43	5	55	5

Table 5 and the following tabulation summarize the data on total play during response:

Control Toy	Ratio Toy Social	Control Social
0.00	2.80	2.80
2.97	0.71	3.43
8.40	1.71	10.80

This activity was commoner in the social than in the toy situation at all age levels, probably due to distractions which the social companion introduced. Although the trends are consistent at all age levels, only the differences between the control-toy and the control-social situations for the five-year-old children were significant. Play during response was commoner among the three-year-old group than among the other age groups, commoner among the four-year-old children than among the five-year group. Ratios for differences between age groups follow:

Age Group, Years	Ratio
3 and 4	4.21
4 and 5	3.57
3 and 5	7.64

Play with test articles and type of situation showed practically no relation among the three-year-old subjects, but the four- and five-year-old subjects tended toward the greatest amount of play in the toy situation. Only the difference between the toy and social situations for the four-year group is statistically reliable.

The following tabulation gives the summarized data on the articles involved in test items which were played with most by the

Article	Age Level 3	4	5	Total
		Per Cent		
Scissors	12	6	6	17
Ball	14	4	4	16
Key	7	10	10	21
Pencil	6	0	1	6
Box	1	1	0	3
Blocks	1	4	0	4
Hook	3	0	0	2
Book	1	0	1	2
Coat and Cap	1	0	1	2
Paper and Sack	1	0	4	4

different age groups. The percentages are based on the total number of times that the articles named were played with by all age groups. The results indicate that the key, ball, and scissors were more conducive to play than the remaining test materials. The three-year-old subjects played with the ball and scissors oftener than the key, and with the pencil oftener than any other group. The younger groups considered only self and completely forgot the command as they became interested in the article involved. The four- and five-year-old children subjugated play as the means of making the response more pleasant.

Forgetting During Response.—Forgetting was considered to be of two types: (1) forgetting due to internal distraction, and (2) forgetting due to external distraction.[4] Tables 6 and 7 present the total amount of each type of forgetting for each age group, and similar amounts in each of the three situations expressed as a percentage of the total for the particular age group concerned. A greater amount of forgetting of the second type appeared among the three-year-old children. There is a marked swing in the other direction for the four- and five-year-old subjects, no instances of forgetting of the second type occurring among the oldest group. Although an explanation of the above findings is not without question, it would certainly appear that the two- and three-year-old children are more subject to distracting influences in the physical environment than are the four- or five-year-old children.

Substitute Activity.—All responses to a command which involved rising from the pillow and subsequent manipulation were considered substitutions if this manipulation did not include successful fulfillment of the command. Data on substitution when summarized show, on the whole, a greater amount of substitute activity in the social situation than in the toy, and more in the toy than in the control. This trend is consistent for the group of subjects of four years of age and above, but somewhat modified for the three-year group. The only significant difference is that between the control and social situations for the five-year-old subjects, although the difference between the same two situations for the three-year-old children approaches significance. The greater share of substitute

[4] A description of the behavior of each type of forgetting is given in the manuscript copy of this study on file at the University of Iowa Library.

Table 6
Percentage of Types of Forgetting Occurring According to Age Groups and Experimental Situations

Age, Years	Children	Situation											
		Control				Toy				Social			
		Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error	Per Cent	Probable Error
		Type of Forgetting											
		1		2		1		2		1		2	
3	16	43	13	28	8	29	11	22	7	29	11	50	8
4	15	26	6	29	12	35	7	43	12	39	7	29	11
5W*	23	29	6			24	6			48	7		
5J*	12	13	7			13	3			75	10		

* The five-year-old group had two different experimenters, W and J.

Table 7
Total, Mean Number and Percentages of Total Types of Forgetting According to Age Groups

Age, Years	Children	Total		Mean		Total Occurring			
						Per Cent	Probable Error	Per Cent	Probable Error
		Type of Forgetting							
		1	2	1	2	1		2	
3	16	7	18	0.44	1.13	11	7	72	7
4	15	23	7	1.53	0.47	34	7	28	11
5W*	23	21	0	0.91		33	2		
5J*	12	8	0	1.00		12	7		

* The five-year-old group had two different experimenters, W and J.

activity occurred at the three-year level and decreased regularly with age beyond that level.

Attempted or Delayed Recall.—In an analysis of differences in recall thought to have some bearing on the memory factor, four types of activity were considered as evidence of this trait: (1) returning to position on pillow and remembering to complete the task on the way, (2) playing during response and returning to complete task, (3) hesitancy and thoughtful expression before carrying out a command, and (4) playing after command was given and then remembering to carry it out.

Playing before starting to comply and then complying successfully was most frequent among the three- and four-year-old groups. The four-year-old subjects seemed to evidence more attempted recall than did any other age group. No consistent relationships were revealed.

Hesitancy was somewhat more prevalent in the social situation than in the toy or control. Remembrance of the command following playing was equally common in the toy and social periods; this was true for both playing before response and playing on the way. The other type of recall occurred almost equally in each of the three situations.

Reaction to an Impossible Command.—In responding to the command "Give me the picture which is hanging on the wall," the three-year-old children tended to rise and reach for the picture

oftener than did the four-year-old subjects. The four-year group characteristically responded with "I can't," which was also the most typical response of the five-year-old children, though in their case it was frequently accompanied by rising. On the second and third statements of the command, all groups tended to cease actually trying to reach the picture and to respond by a verbal expression. There were no outstanding differences among the three age groups.

Manifestation of Dislike for Test Situation.—Dislike for the test commands was expressed oftenest in the toy situation, a fact probably accounted for by the greater interest in the toy situation. The trend was practically consistent for each age group. The subjects at the four- and five-year age levels tended to express their dislike more frequently than did the three-year-old subjects. Two two-year-old children attempted to leave the room or refused to obey, neither stating in so many words that he disliked the game. The three- and four-year-old subjects used peculiar means of bringing their thoughts before the experimenter, as in the subtle suggestion of M651, "Then I'll come back and look at the picture book." Others pretended to talk to themselves. At the five-year level the dislike was expressed for the first time in terms involving the experimenter or the companion or some other person.

Complexity of Commands as Related to Various Aspects of Response.—Commands 3 and 6 involved practically the same movements on the part of the subject, but in the latter there was less relationship between parts. For the three-year-old group the percentage of correct response was four times greater for the third command than for the sixth. For the four-year-old children the third command elicited twice as high a percentage of correct executions and for the oldest group, one and one-half times as high a percentage. Differences between the two commands are significant for the three- and the five-year-old groups.

At every age level the first part of the complex command was failed oftenest and the third part executed most successfully. It is somewhat surprising that the second part of the command should have been performed correctly oftener than the first since it is generally held that in a series, such as a consecutive presentation of numbers, the two extremes stand out clearest and are best remembered. There is experimental evidence in the field of psychol-

ogy (Jenkins (4) and Thorndike (6)), however, which supports the present finding.

The ratios of differences between age groups in forgetting and substitution on the command 3 and 6 are:

Age Group, Years	Substitution	Forgetting
3 and 4	1.71	2.86
4 and 5	4.21	2.10
3 and 5	6.66	8.09

As another check on the relation of complexity of commands to response, the number of cases of correct activity, of substitution, and of forgetting were determined for the four simple commands (1, 2, 4, and 7) and for the one compound command (5). The percentage of correct executions of the simple commands was higher than that for the compound command; the percentage of substitute activity and of forgetting was lower. With increase in age, there was a consistent increase in percentage correct and decrease in percentage of substitution and forgetting. The manner of determining percentages in this case did not permit determination of significant differences.

SUMMARY AND CONCLUSIONS

The present study was undertaken with a view toward analyzing some of the factors involved in the preschool child's compliance with commands. Couched in practical terms, it represents an attempt to determine whether the seemingly simple command-obey situation may not in reality be as complex as the more subtle, indirect methods of child control advocated at present.

The subjects were seventy-seven children from the laboratories of the Iowa Child Welfare Research Station, ranging in age from two years, five months to five years, eight months. They were given eight commands under three different experimental situations: (1) the control, (2) the toy, and (3) the social. To equalize practice effects and thus to make the situations more comparable the children in each preschool laboratory were divided into three random groups for varying the order of presenting the three situations.

Twenty-five of the five-year-old group were tested by two experimenters, working independently, to establish the reliability of the tests. In both the reliability testing and the main experiment,

the three test periods were spaced for each subject at intervals of a week.

In general, this study revealed differences both between age groups and between experimental situations in children's compliance with commands. These differences were less evident, however, in the time taken for response than in the patterns of behavior manifested. As the children grew older they tended to comply with the task with less substitute activity and forgetting, with fewer distractions of an external nature, and with fewer demands for repetition on the part of the experimenter.

Of the three experimental situations, the toy seemed to absorb the interest of the subjects most and to yield the greatest number of variations in behavior. The subjects disliked interruption in the toy situation more than in any other period.

The total number of occurrences of the types of activity studied was divided by the total occurrences of all types of activity noted. The percentages obtained, based on 1,750 items of behavior, follow:

Type of Behavior	Per Cent
Question while complying (''how,'' ''what'')	14
Respond before experimenter completes command	13
Initial verbal response	13
Substitute activity	11
Verbal excuses	11
Repetition by experimenter	10
Play during response	8
Play before response	5
Forgetting	4
Play with test articles	4
Dislike of test situation	3
Repeat command	2
Remark on previous period	2
Total	100

These per cents indicate the relative frequency of the various behavior patterns evidenced by the subjects in the command-obey situations of this investigation.

The activity of the three-year-old subjects involved the greatest amount of repetition and ''showing'' on the part of the experimenter, of forgetting, of play during response, of play with test articles, of prolonged response, and of substitute activity of the unrelated and moderately related types. The four-year-old children evidenced the greatest amount of delayed or attempted recall,

of questioning of all types, of expression of dislike of test situations, and of substitution of the closely related and confused types. Five-year-old subjects responded before completion of the command more than any other group and repeated the command while complying more than did the three- and four-year-old children.

The following activities were more frequent in the control situations than in the toy or social: (1) response before completion of the command by the experimenter, (2) questioning of the "what" and "how" type during compliance, (3) questioning of the "why" type during compliance, and (4) remarks on the previous period or periods. Activities most frequent in the toy situation were: (1) delayed preresponse periods, (2) lengthened response periods, (3) repetition, (4) play before response, (5) initial response in the form of questioning, (6) play with articles involved in the test situation, (7) verbal excuses, and (8) dislike of the experimental commands. The five activities which were commoner in the social than in the other two situations were: (1) playing during response, (2) forgetting, (3) initial response in the form of excuses, (4) substitute activity, and (5) repetition of the command by the subject while complying.

Basing conclusions on the experimental findings, it would appear that obedience is even more complex than one would gather on first impression. Other individual factors are apparently as significant in determining compliance with commands as are age, sex, or mental status. This would indicate that in dealing with obedience or disobedience treatment of an individual nature is essential. In the present condition of the problem, at least, investigation can be of more service in discovering the factors related to obedience and the behavior patterns appearing in the command-obey situation than it can for discovering generalizations applicable to all.

REFERENCES

1. Bohannon, E. W.: A study of peculiar and exceptional children. Ped. Sem., 1896-1897, 4, 3-60.
2. Fisher, R. A.: Statistical methods for research workers. 2nd ed., rev. & enl. London: Oliver & Boyd, 1928. Pp. xi, 269.
3. Garrett, Henry E.: Statistics in psychology and education. New York: Longmans, Green, 1926. Pp. xiii, 317.
4. Jenkins, John G., and Dallenbach, Karl M.: The effect of serial position upon recall. Amer. J. Psychol., 1927, 38, 285-291.
5. Rietz, H. L. [editor]: Handbook of mathematical statistics. Boston: Houghton, Mifflin [c. 1924] Pp. viii, 221.
6. Thorndike, Edward L.: The influence of primacy. J. Exper. Psychol., 1927, 10, 18-29.

PART FIVE

A STUDY OF THE BEHAVIOR OF YOUNG CHILDREN IN ANGER*

by

AGNES FAIRLIE RICKETTS

* This study was directed by Dr. Esther Van Cleave Berne

A STUDY OF THE BEHAVIOR OF YOUNG CHILDREN IN ANGER

The purpose of the present investigation was to study the behavior of young children in anger, the situations in which anger appeared, and the resolution of the anger. The procedure involved: (1) the devising of a blank on which could be recorded observations of aspects of anger behavior, (2) the training of observers, (3) the determining of reliability of observers, and (4) observation of aspects of anger in twenty-one children in a preschool over a period of two years, and in twenty-seven children in their homes.

Subjects of the investigation were twenty-one children enrolled in the American Association of University Women Pre-school for Young Children in Jackson, Mississippi during the time of observation. Ten of these same children in Jackson, Mississippi and seventeen different children in Iowa City, Iowa were observed by their mothers in their homes. The subjects ranged from twenty-nine to sixty-three months in age. All were in good general health, as indicated by the physical examination given at the opening of the year. The children in both Jackson and Iowa City were from families of average or better than average social and economic status.

The data of the investigation were collected through use of observational techniques. Daily observations in the Jackson preschool were made during the months from January to April, 1930 and 1931. They were taken during one of the free-play periods, from nine to about nine forty-five o'clock, or from eleven to eleven forty-five. Since the program of the day was a flexible one and since several mothers who gave assistance at music and rhythm periods came at different hours on different days, the writer's time for recording observations could not always be the same.

The record blanks which were used in the study were devised after testing out a number of tentative forms. These forms were used for making observations on children enrolled in one of the preschool laboratories of the Iowa Child Welfare Research Station during the summer of 1929. One of the tentative blanks was used in the homes by three mothers of Iowa City and ten of Jackson,

Mississippi. Suggestions made by these mothers were incorporated in the making of the final blank.

It was thought that the items on the blank were by no means exhaustive and space was left for insertion of additional items which might describe the situations more exactly. Since the blank was devised for the use of inexperienced as well as experienced observers, the terms used were in simple language and intended to be interpreted in the commonly accepted sense. However, the following definitions were worked out by the writer for the observer who assisted in determining reliability in the preschool group:

Fussing: a mild verbal protest against a situation.
Scolding: a vigorous verbal protest.
Running: a manifestation of anger when a child runs either towards or away from the cause of his anger, or runs about, apparently aimlessly, as if in an effort to work off his emotion.
Screaming: a sharp, shrill, prolonged yelling, either with or without tears.
Squealing: short, sharp, shrill yells without tears.
Stiffening: making the body rigid or unbending, or silent refusal to budge or to be moved.
Sitting down hard: a situation in which the child sat down forcibly on the floor and remained sitting stiffly.
Whimpering: a low crying or whining vocalization of complaint.

As it was necessary for the teacher to be unencumbered by a lapboard, she found it practical to memorize the items on the blank and carry in her pocket a pad on which to record each case of anger or resistance as soon as it was observed and treated, if treatment were given. These notes were transferred to the blanks each day after the children went home.

Ten mothers in Jackson, Mississippi, who agreed to make records on their own children, were met and given instructions in the use of the blank by the writer. Cases of anger were described and Stoelting's pictures showing facial expression of various emotions, including that of anger, were shown. For practice, the mothers were asked to select the pictures expressing anger; in every instance the correct selection was made. The questions and items on the blank were also explained. Each mother took ten blanks on which to make practice trials of recording anger. Following this, the blanks in their final form were given them with an instruction sheet as to the making of records. The seventeen mothers of preschool children in Iowa City who also kept records were given instructions

similar to the above by a member of the staff[1] of the Iowa Child Welfare Research Station.

It was planned to have the mothers record for one whole week in each of the three months, January, February, and March of 1930, every instance of anger observed in the child. Due to illnesses and other disturbances of family routine, however, this plan could not be followed consistently. Of the two groups of mothers, twenty-seven in number, fourteen kept records for three weeks though not always in consecutive months. Six kept records for two weeks and eight for only one week. In all, the mothers recorded 220 instances of anger on the part of their children in the homes.

To test the reliability of the teacher, another observer[2] recorded with the writer. In preparation for this check the two observers made twelve preliminary records on the observers' blank, first having agreed on definition of terms. After the preliminary blanks were compared, records of thirty-six cases were made by the observers working independently though keeping near enough together to observe behavior from a comparable location.

RESULTS

Reliability of Observers

The per cent agreement of the writer and the assistant observer on the various items follows:

Category	Per Cent Agreement	Probable Error
Anger	97	1.9
Manifestations	86	2.4
Situations	97	1.9
Recovery	88	1.5
How helped	87	1.1
Duration	97	1.9
Results	88	3.8
Mean	91.4	

The range of per cent is from 86 to 97, with an average of 91.4. This indicates that the observers were highly reliable in their observation.

1 Dr. Elizabeth Moore Manwell under whose direction the preliminary work on this study was done.

2 Mabel C. Williams Kemmerer, Ph.D., formerly Associate Professor of Psychology, State University of Iowa, recorded with the writer for reliability.

The reliability of the twenty-seven mothers who recorded on the anger behavior of their children was not determined from a study of the blanks filled out by them. It was evident that they were unreliable in recording certain items: (1) The fact that several items were frequently checked under category 4, "How was the child helped?" indicated to the writer that the mothers sometimes recorded methods tried rather than those that appeared really to help the child to gain control. (2) Punishment sometimes appeared to be given in order to control the situation causing the anger rather than to help the child to control the anger itself. (3) In at least ten instances, both the item "control himself" in category 4 and an item in category 5 (method of helping the child to control) were checked. This showed a misunderstanding of the item in category 4 as meaning that the child was not helped, but controlled himself. (4) Some categories were not checked at all. Finally, (5) there was no way of determining whether all cases of anger in the recording period were actually reported. Since two mothers were unwilling at any time to discuss their children's behavior with the teacher and to fulfill their responsibility of making observations at the preschool, it is possible that the records may not have given adequately the anger behavior of the children in their homes. On the whole, then, the data from the mothers were less reliable than the data from the preschool.

Analysis of Record Blanks

In the analysis of data, a different classification was used from that employed on the record sheet. The main divisions of this classification were: (1) number of cases of anger, (2) manifestations of anger, (3) situations in which anger was displayed, (4) manner in which the child recovered equilibrium, (5) adults' method of helping child regain emotional equilibrium, (6) duration of anger, and (7) successful and unsuccessful ways of preventing recurrence of anger in similar situations.

Manifestations of Anger.—The two first divisions of the above classification will be discussed together. Table 1 shows manifestations of anger in the children in preschool and at home arranged according to frequency in the preschool group. It also shows the percentage of each item of manifestation of anger to the total number of cases of anger in each group.

In the preschool group the most frequent manifestation of anger

was in the angry facial expression, with crying next in frequency. The order of highest frequency in the home group was: angry facial expression, crying, fussing, scolding, and screaming. Crying

Table 1

Manifestations of Anger in a Group of Children Observed in Preschool and in Children Observed at Home, Arranged According to Frequency of Occurrence in Preschool Group

Manifestation	Preschool		Home	
	Cases of Anger	Per Cent	Cases of Anger	Per Cent
Angry facial expression	208	100	220	100
Crying	81	39	147	67
Fussing	50	24	45	20
Pushing, pulling	44	21	9	4
Scolding	44	21	39	18
Screaming	28	13	29	13
Striking	17	8	18	8
Squealing	11	5		
Sulking, pouting	11	5	12	6
Stiffening	10	5	16	7
Snatching	6	3		
Kicking	5	2	17	8
Struggling	5	2		
Whimpering	4	2	13	6
Stamping foot	2	1	2	1
Biting	2	1		
Scratching	2	1		
Sobbing	2	1		
Holding things tight	2	1		
Refusing to move	2	1		
Throwing self on floor	1	.5	1	.5
Running	1	.5	6	3
Pinching	1	.5		
Chewing clothing	1	.5	1	.5
Jumping up and down			4	2
Spitting			4	2
Sitting down hard			3	1
Attempting to vomit			1	.5

occurred in the home in 67 per cent of the cases. This is the most noticeable difference between the two groups.

That pushing and pulling shows a much lower per cent in the homes than in the preschool probably can be explained from the nature of the situation in which anger occurred. In preschool 134

of the cases of anger out of 208, as against 46 in 220, were due to conflicts over toys or play equipment. This situation provoked the pushing, pulling, and struggling.

To determine whether there were significant age differences in the means of the scores of anger occurrence, Fisher's method for determining the significance of the difference between means of distributions involving a small number of cases was used. Fisher's formula[3] is

$$t = \frac{\bar{x} - \bar{x'}}{s} \frac{(n_1 + 1)\ (n_1 + 2)}{n_1 + n_2 + 2}$$

The results are given below:

Group	Younger Group	Older Group	Standard Error of Estimate	t	P when n = 27
Preschool	2.23	.98	.45	2.77	Between .02 and .01
Home	6.20	4.20	.83	2.41	Between .05 and .02

The data indicate a significant difference between the means for the younger groups and for the older groups. It may thus be assumed that similar groups of children, approximately three years and four years old, would show a similar difference in anger frequency.

As a further check on age differences, the anger manifestations of nine of the children who were used as subjects were compared for the two consecutive years 1930 and 1931. There was a decrease in the following items of manifestations: tantrum, stamping feet, biting, snatching, kicking, pushing and pulling, chewing clothing, crying, screaming, squealing, calling for mother, and stiffening. Doubtless, the children were learning that many of these methods were unsuccessful and socially disapproved in the school. Decrease in occurrence was manifested for situations which involved thwarted wishes and the missing of the mother. Three types of recovery showed a decrease of occurrence: working the anger off, being helped to control, and stopping without effort.

The following items of manifestation indicated an increase in 1931 as compared with 1930: running, scratching, pinching, striking, struggling, whimpering, fussing, scolding, sulking and pouting,

[3] Fisher, R. A.: Statistical Methods for Research Workers. 2nd ed., rev. & enl. London: Oliver Boyd, 1928. Pp. xi, 269. (p. 99)

and holding things tight. An increase in occurrence was found for the following situations: interruption of interest, dressing-toilet situations, conflicts, upset routine, fear, and teasing. It is notable that there was also an increase in recovery through control of self.

The conspicuous increase in the items "fussing" and "scolding" probably can be explained by loss of timidity and by an increase in verbalization in the second year. The increase was due to the behavior of the four youngest children in the preschool in 1930, two of whom were just three years old and two under three. In this year they were noticeably more timid, less social, and less verbal than in 1931.

The increase in percentage in toilet and dressing situations is explained by individual development. The increase was due to two of the youngest children, who in the second year had become clothes-conscious. The conflicts in each case were with the mothers over certain garments, sweaters and long stockings being particular causes of irritation. The increase in percentage of cases in which the child was believed to exercise self-control in recovery from anger is to be noted. It might indicate a significant age difference at the preschool level in regard to self-control in anger. Since the number of cases was so small, however, no general assumptions can be drawn, and no computation of significant differences was attempted.

In an endeavor to study sex differences, the mean occurrence of anger for boys and girls at the two age levels, twenty-nine to forty-seven months and forty-eight to sixty-three months, was determined separately for preschool and home records. Fisher's method, already referred to, was used for determining the difference between means involving a small number of cases. In no case was there found to be a significant difference between the means. Hence it cannot be assumed that for similar groups of children similarly observed there is a difference in amount of anger behavior related to sex.

Situations in Which Anger Was Displayed.—Table 2 shows the number of cases of anger occurring in preschool and at home according to situations and the percentage in each situation. In the preschool group the days observed were the days the child was present in the recording period; in the homes, the days involved were those in which the mother was observing and recording.

As an examination of the table shows, the percentage of occurrence in anger situations at home was greater than in preschool in the case of interruption of interesting activity, thwarting an apparent wish, conflicts over toilet and dressing, being teased, and being urged to eat. The most marked difference occurred in conflicts over toilet and dressing situations. In this summary, dressing situations included both dressing and undressing, washing, bathing, and teeth brushing. These situations are complicated and intensive in the homes and probably more provocative of anger reaction than they are in the preschool.

Table 2
Summary of Situations in Which Anger Occurred in Preschool, and at Home, With Per Cent of Occurrence in Each Situation

Situation	Preschool		Home	
	Cases	Per Cent	Cases	Per Cent
Interesting activity interrupted	10	5	37	17
Thwarting apparent wish	8	4	32	15
Conflicts over toilet and dressing	6	3	81	37
Conflicts over playthings	134	64.4	46	21
Usual routine disturbed	7	3	5	2
Hurt, punished	18	9	4	2
Afraid	2	1	1	.4
Separated from mother	17	8		
Being teased	5	2	10	5
Urged to eat			4	2
Taking other child's part	1	.5		
Total	208		220	

The larger percentage of conflicts in the preschool was over playthings and play equipment. This percentage is more than three times as large as the percentage of anger in like situations at home. The preschool teacher did a large part of her observations at the play period while the mothers' observations probably were made largely in other situations. When a child is at play in the home, the mother is likely to be attending to other matters.

There seemed to be no value in computing probable errors of per cent on the above data.

Manner in Which the Child Recovered Equilibrium.—The data

which were secured on the manner in which the subjects recovered from anger are summarized below:

Manner of Recovering Equilibrium	Instances	
	Home	Preschool
Worked off anger	44	41
Helped to control	107	108
Stopped without effort	17	17
Controlled self	43	43

The above data include records for both 1930 and 1931. There is a slight tendency for more of the later as opposed to the earlier occurrences of anger to appear in the "controlled self" column. The most evident feature of the above summary is the large number of instances in which subjects were "helped to control."

Adults' Method of Helping Child Regain Emotional Equilibrium.—A comparison of the teacher's and the mothers' methods of helping children recover from anger revealed a number of differences. The methods used the greatest number of times by mothers were ignoring, isolating, spanking, threatening, and saying "Stop crying." The methods used in the greatest percentage of cases by the teacher were appealing for self-control, explaining, steadying, taking child in lap, suggesting fair play, substituting other interests, and removing the cause. The differences may have been due to the nature of the situations, to other claims on a busy mother's time and attention as opposed to the prior claim of the child on the teacher's services, and to the fact that the teacher could be more objective in her treatment of the child and that she was very definitely striving to further the child's ability to help and to control himself.

Duration of Anger.—The data on duration of anger were rough estimates as to time, except for prolonged anger in which cases the time could be noted. The estimates were put into three groups: (1) less than one minute, (2) between one and five minutes, and (3) over five minutes.

In the preschool 85 out of 208 cases were estimated at less than one minute, 99 cases between one and five minutes, and 24 cases at over five minutes. The mothers reported 32 cases at less than one minute, 135 cases between one and five minutes, and 51 cases over five minutes. The duration of anger from these figures seems longer in the homes. However, on account of the lack of precision in

recording time, no conclusion can be drawn from these data. It is possible the time in many instances seemed longer to the mothers than it really was; it may be that very brief occurrences of anger were not observed and recorded; or it may be that the children really tended to show anger longer in the home than in the preschool situation.

Successful and Unsuccessful Ways of Preventing Recurrence of Anger in a Similar Situation.—The material bearing on this problem was secured in response to the question, "What will you do to prevent this happening again?" The question was appended rather to encourage mothers to make a critical study of the anger situations than with the expectation of collecting valuable data. The answers were obviously very subjective.

The teacher reported twenty-nine instances in which it was believed that anger was successfully prevented; the mothers reported eighteen instances. Methods thought to be successful in preventing anger in a similar situation were: (1) giving praise for evidence of self-control, (2) explaining in advance of a possible provocation, (3) suggesting fair play in advance, (4) reminding a child of a former experience, and (5) winning the child's confidence. Two mothers recorded that they found explaining and reasoning unsuccessful in attempts to forestall an anger outburst.

SUMMARY AND CONCLUSIONS

The present study was undertaken to investigate the behavior of young children in anger, the situations in which anger appeared, and the resolution of the anger. Subjects of the experiment were twenty-one children enrolled in the preschool at Jackson, Mississippi and seventeen children from the Iowa Child Welfare Research Station of the State University of Iowa. The procedure of the investigation involved: (1) devising a blank on which could be recorded observations of aspects of anger behavior, (2) training the observers, (3) determining the reliability of observers, and (4) observing aspects of anger in twenty-one children in a preschool over a period of two years and in twenty-seven children in their homes.

The following results were yielded by the study:

1. An average agreement of 91.4 per cent was found between two observers recording on the record blank in the preschool situa-

tion on thirty-six cases of anger. Reliability of mothers' records was not determined.

2. The most noticeable difference in manifestations of anger in preschool and in homes was in crying. Pushing, pulling, and struggling were evidenced more in the preschool than in the homes, probably because of the nature of the anger situations.

3. A significant age difference in anger of three-year-old and four-year-old children was found for the children in preschool and in homes, showing a tendency for anger to decrease with increase in age.

4. Analysis of data on nine children attending the preschool for the two successive years showed a decrease in striking, kicking, pushing, pulling, crying, and struggling and an increase in percentage of fussing and scolding. An increase in number of cases in which the children were thought to exercise self-control was apparent, but the number of cases was too small to determine the significance of the differences.

5. No true sex differences were found in the manifestations of anger.

6. In a study of the manner of recovery from anger, it was found that in the greatest number of cases the children were helped by the adult to control themselves, and in the smallest number the children stopped without effort. There was a tendency for the later cases of anger to appear as cases of self-control.

7. The small number of cases involved in the present study makes many of the results only suggestive. A similar study on a more extensive scale would doubtless yield a valuable body of information on the subject of anger in young children.

Form No. 3.

PSY, RES.L-1

Bureau of Educational & Psychological Research Library.

The book is to be returned within the date stamped last.

.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

WBGP-59/60-5119C-5M